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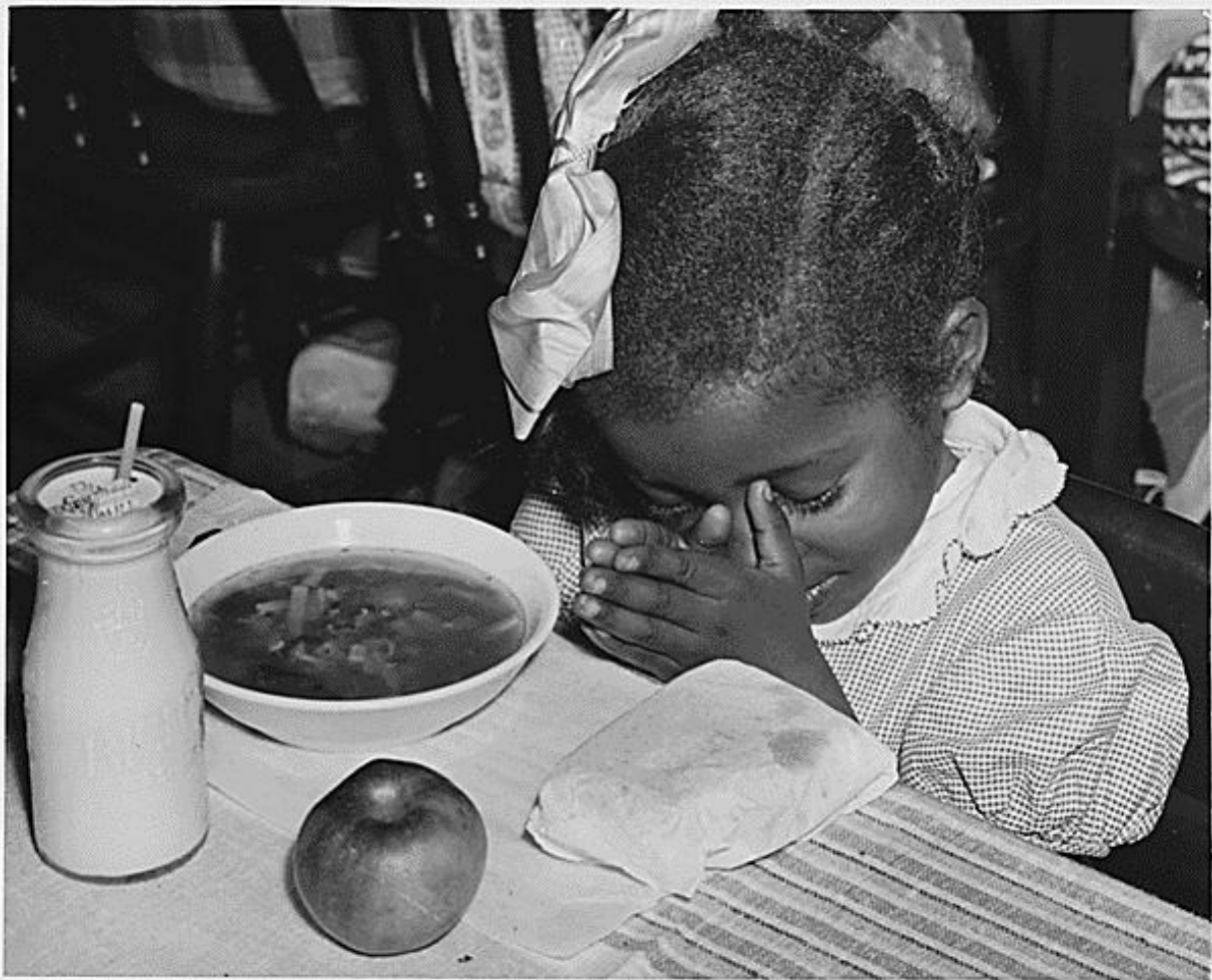
Introduction to the Macroeconomic Perspective

class="introduction"

The Great Depression

At times, such as when many people are in need of government assistance, it is easy to tell how the economy is doing. This photograph shows a little girl praying before school lunch towards the end of the Great Depression. These meals were often funded by the state to help people cope with the poverty caused by mass unemployment . At other times, when some are doing well and others are not, it is more difficult

to ascertain
how the
economy of a
country is
doing. (Credit:
Unknown,
1936)



Note:

How is the Economy Doing? How Does One Tell?

From about 1994 to 2008 South Africa's economy grew at a fast pace. However, from 2008 until 2016 the country's economic growth slowed

right down along with that of many other countries around the world. What causes the economy to expand or contract? Why do businesses fail when they are making all the right decisions? Why do workers lose their jobs when they are hard-working and productive? Are bad economic times a failure of the market system? Are they a failure of the government? These are all questions of macroeconomics, which we will begin to address in this chapter. We will not be able to answer all of these questions here, but we will start with the basics: How is the economy doing? How can we tell? The macro economy includes all buying and selling, all production and consumption; everything that goes on in every market in the economy. How can we get a handle on that? The answer begins more than 80 years ago, during the Great Depression which started in the United States of America and spread around the world from there. American president Franklin D. Roosevelt and his economic advisers knew things were bad—but how could they express and measure just how bad it was? An American economist named Simon Kuznets, who later won the Nobel Prize for his work, came up with a way to track what the entire economy is producing and express it as a figure. The result was called the gross domestic product (GDP). To this day GDP remains our basic measure of macroeconomic activity. In this chapter, you will learn how GDP is constructed, how it is used, and why it is so important.

The Great Depression in South Africa

The Great Depression had a major economic and political effect on South Africa, as it did on most countries at the time. As world trade collapsed, demand for South African agricultural and mineral exports fell drastically. This sudden weakening of demand led to steep falls in prices of commodities that had been profitable to many Afrikaner farmers. The price of wool, for example, fell 75% between 1925 and 1933.

South Africa was saved from a complete collapse by its gold mining industry—one of the largest and most advanced at the time—as the price of gold rose rapidly as investors thought it was a safe investment compared with shares that could be purchased on the stock exchange (share prices were collapsing). Growing gold exports compensated somewhat for the loss of other trade revenue. The Great Depression caused major social and political disruptions. The National Party in power at the time lost support as the weak economy forced the gold mining corporations to replace white laborers with lower-paid black laborers.

Note:**Introduction to the Macroeconomic Perspective**

In this chapter, you will learn about:

- Measuring the Size of the Economy: Gross Domestic Product
- Adjusting Nominal Values to Real Values
- Tracking Real GDP over Time
- Comparing GDP among Countries
- How Well GDP Measures the Well-Being of Society

Macroeconomics focuses on the economy as a whole (or on whole economies as they interact between countries). What causes recessions? What makes unemployment stay high when recessions are supposed to be over? Why do some countries grow faster than others? Why do some countries have higher standards of living than others? These are all questions that macroeconomics addresses. Macroeconomics involves adding up the economic activity of all households and all businesses in all markets to get the overall demand and supply in the economy. However, when we do that, something curious happens. It is not unusual that what results at the macro level is different from the sum of the microeconomic parts.

Indeed, what seems sensible from a microeconomic point of view can have unexpected or counterproductive results at the macroeconomic level. Imagine that you are sitting at an event with a large audience, like a live concert or a soccer game. A few people decide that they want a better view, and so they stand up. However, when these people stand up, they block the view for other people, and the others need to stand up as well if they wish to see. Eventually, nearly everyone is standing up, and as a result, no one can see much better than before. The rational decision of some individuals at the micro level—to stand up for a better view—ended up being self-defeating at the macro level. This is not macroeconomics, but it is a fair explanation of what can and does happen at an economic level.

Macroeconomics is a rather massive subject. How are we going to tackle it? Figure 2 illustrates the structure we will use. We will study macroeconomics from three different perspectives:

1. What are the macroeconomic goals? (Macroeconomics as a discipline does not have goals, but we do have goals for the macro economy.)
2. What are the frameworks (or methods of analysing) economists can use to analyze the macroeconomy?
3. Finally, what are the policy tools governments can use to manage the macroeconomy?

Macroeconomic Goals, Framework, and Policies



This chart shows what macroeconomics is about. The box on the left indicates a consensus of what are the most important goals for the macro economy, the middle box lists the frameworks economists use to analyze macroeconomic changes (such as inflation or recession), and the box on the right indicates the two tools the government uses to influence the macro economy.

Goals

In thinking about the overall health of the macroeconomy, it is useful to consider five primary goals: economic growth, low unemployment, low inflation, reduced poverty (greater equity) and a stable balance of payments.

- Economic growth ultimately determines the prevailing standard of living in a country. Economic growth is measured by the percentage

change in real (inflation-adjusted) gross domestic product. A growth rate of more than 3% is considered good.

- Unemployment, as measured by the unemployment rate, is the percentage of people in the labor force who do not have a job. When people lack jobs, the economy is wasting a precious resource—labor, and the result is fewer goods and services produced. Unemployment, however, is more than a statistic—it represents people's livelihoods. While measured unemployment is unlikely to ever be zero, a measured unemployment rate of 5% or less is considered low (good).
- Inflation is a sustained increase in the overall or general level of prices, and is measured by the consumer price index. If many people face a situation where the prices that they pay for food, shelter, and healthcare are rising much faster than the wages they receive for their labor, there will be widespread unhappiness as their standard of living declines. For that reason, low inflation—an inflation rate of 1–2%—is a major goal.
- A more just or fair economic order and reduced poverty is a very important goal for all societies. South Africa as a country has one of the most inequitable (unequal and unfair) income distributions in the world. This is a recipe for social unrest and unhappiness. A good goal would be for every South African to have access to basic healthcare, education and shelter and to enjoy the food security that comes with gainful employment.
- In a world that is increasingly interconnected, most countries no longer conduct their affairs in isolation, including trade. Most countries tend to specialise in certain exports and use the proceeds of this trade to import goods and services they lack. Ideally a country should have sufficient import earnings/revenue to pay for its import expenditure/payments i.e. a balance between incoming and outgoing payments.

Frameworks

As you learn in the micro part of this book, principal tools used by economists are theories and models. In microeconomics, we used the theories of supply and demand; in macroeconomics, we use the theories of aggregate demand (AD) and aggregate supply (AS). This book presents two

perspectives on macroeconomics: the Neoclassical perspective and the Keynesian perspective, each of which has its own version of AD and AS. Between the two perspectives, you will get a good understanding of what drives the macroeconomy.

Policy Tools

National governments have two tools for influencing the macroeconomy. The first is monetary policy, which involves managing the money supply and interest rates. The second is fiscal policy, which involves changes in government spending/purchases and taxes.

Each of the items in Figure 2 will be explained in detail in one or more other chapters. As you learn these things, you will discover that the goals and the policy tools are in the news almost every day.

Measuring the Size of the Economy: Gross Domestic Product

By the end of this section, you will be able to:

- Identify the components of GDP on the demand side and on the supply side
- Evaluate how gross domestic product (GDP) is measured
- Contrast and calculate GDP, net exports, and net national product

[missing_resource: empiricalman.jpeg]

Macroeconomics is an empirical ("measuring") subject, so the first step toward understanding it is to measure the economy.

How large is the South African economy? The size of a nation's overall economy is typically measured by its **gross domestic product (GDP)**, which is the value of all final goods and services produced within a country in a given year. The measurement of GDP involves counting up the production of millions of different goods and services—smart phones, cars, music downloads, computers, steel, bananas, school and university educations, and all other new goods and services produced in the current year—and summing them into a total Rand value. This task is straightforward: take the quantity of everything produced, multiply it by the price at which each product sold, and add up the total. In 2015, South Africa's GDP totalled close to R3.06 trillion (Statistics South Africa: 2016), the second largest GDP in Africa after Nigeria.

Each of the market transactions that enter into GDP must involve both a buyer and a seller. The GDP of an economy can be measured either by the total Rand value of what is purchased in the economy, or by the total Rand value of what is produced. There is even a third way, as we will explain later.

GDP Measured by Components of Demand

Who buys all of this production? This demand can be divided into four main parts: consumer spending (consumption, C), business spending

(investment, I) which includes investment spending by government; government spending on goods and services (government consumption, G), and spending on net exports (Exports, X minus Imports, Z). Table 1 shows the components of GDP from the demand (or expenditure) side and Figure 1 provides a visual of the percentages. GDP at current market prices in 2015 totalled R3,990,953 million.

	Components of demand/expenditure (Rm)	Percent of total
Consumption, C	2 428 813	61
Investment, I	778 571	20
Government, G	810 929	20
Exports, X	1 233 094	31
Imports, Z	-1 273 535	-32
Residual	13 081	
	3 990 953	

Table 1. Components of SA GDP on the expenditure/demand side, 2015 (South African Reserve Bank: 2016).

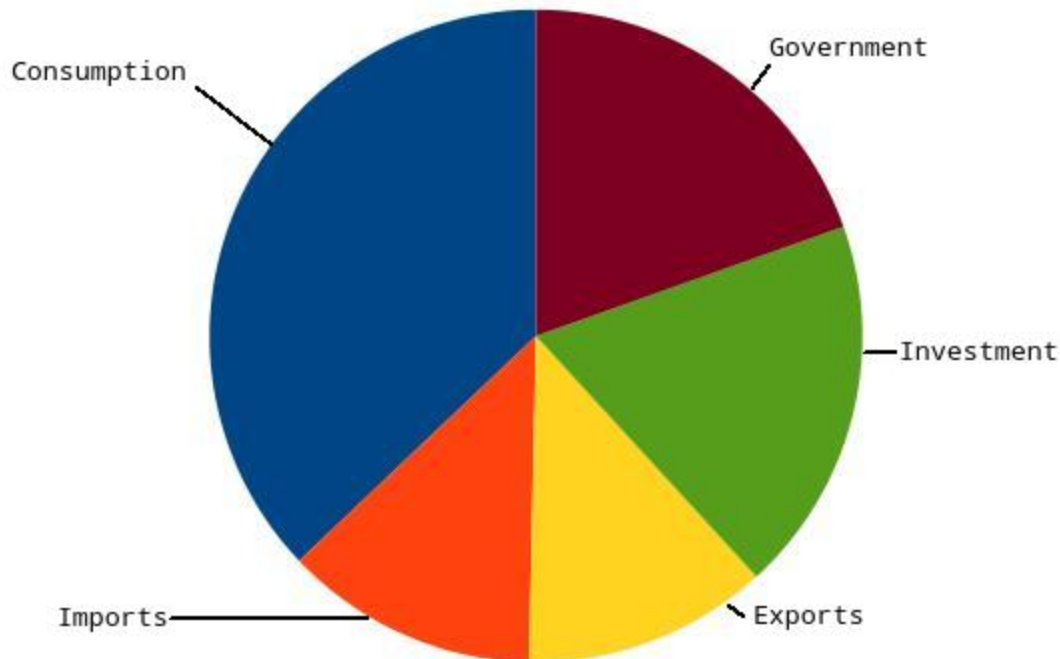


Figure 1. Components of SA GDP on the expenditure/demand side, 2015 (Components of SA GDP on the expenditure/demand side (South African Reserve Bank: 2016))

Note:

What is meant by the word “investment”?

What do economists mean by investment, or business spending? In calculating GDP, investment does NOT refer to the purchase of shares or unit trusts on the stock exchange or bonds or the trading of financial assets. It refers to the purchase of new capital goods, that is, new commercial real estate (such as buildings, factories, and stores) and equipment, residential housing construction, and inventories (goods that have been produced but not yet sold). Inventories that are produced in the current year are included in the current year's GDP—even if they have not yet been sold. From the accountant's perspective, it is as if the firm invested in its own inventories. Gross investment spending (which includes government investment

spending) as at quarter 4 in 2015 was R813,319 million (i.e. over R800 billion) according to the South African Reserve Bank.

Consumption expenditure by households is the largest component of GDP, accounting for about two-thirds of the GDP in any year. This tells us that consumers' spending decisions are a major driver of the economy. However, consumer spending is a gentle elephant: when viewed over time, it does not jump around too much.

Investment expenditure refers to purchases of physical plant and equipment, primarily by businesses (although government investment spending is included in "Investment" spending, I). If Checkers builds a new store, or Toyota buys robots, these expenditures are counted under business investment. If the Department of Home Affairs buys new fingerprint scanners to process identity documents and passports this would also be termed "investment" spending. Investment demand is far smaller than consumption demand, typically accounting for only about 15–18% of GDP, but it is very important for the economy because this is where jobs are created. However, it fluctuates more noticeably than consumption. Investment spending is volatile; new technology or a new product can boost business investment, but then confidence can drop and business investment can pull back sharply.

If you have noticed any of the infrastructure projects (electrification, 2010 Football World Cup stadiums, new bridges, highways, airports, ports, schools, universities, clinics) launched since 1994, you should appreciate how important government spending can be for the economy. Government expenditure in South Africa ranges between 20-25% of GDP, and includes spending by all three levels of government: local, provincial, and national. The only part of government spending counted in demand is government purchases of goods or services produced in the economy. Examples include the government buying a new fighter jet for the Air Force (national government spending), building a new provincial road (provincial government spending), or preparing a new refuse dump site (local government spending). A significant portion of government budgets are transfer payments, like pension and unemployment benefits, military

veteran's benefits, and Social Security payments such as child care and disability grants etc. These payments are excluded from GDP because the government does not receive a new good or service in return or exchange. Instead they are transfers of income from taxpayers to others. If you are curious about the awesome undertaking of adding up GDP, read the following Clear It Up feature.

Note:

How do statisticians measure GDP?

Government economists at the South African Reserve Bank and Statistics South Africa put together estimates of GDP from a variety of sources. The compilation of national accounts statistics in South Africa is undertaken by the National Accounts Division at the South African Reserve Bank and Statistics South Africa, both located in Pretoria (International Monetary Fund: 2016). Statistics South Africa is responsible for compiling the production side of the national accounts, while the Reserve Bank is responsible for compiling the expenditure side of the national accounts, as well as a comprehensive set of production, distribution and accumulation accounts in an integrated manner for the institutional sectors and the balance of payments. The reconciliation of any statistical discrepancy between GDP compiled by the production approach and GDP compiled from the expenditure approach is allocated in the residual item.

Five yearly surveys of household expenditure in the country are used to estimate the average household's expenditure on goods and services. This average value per household and per type of product or service is then multiplied by the number of households according to the population census to obtain total expenditure on goods and services. This approach ensures that a large part of the informal economy's production is included in private consumption expenditure. Retail trade sales published in the monthly survey of retail trade by Statistics South Africa are also used to produce estimates of consumer expenditure. Data published by the Retailer Liaison Committee and other appropriate surveys are used to confirm the accuracy of household consumption expenditure estimates (International Monetary Fund: 2016).

Gross fixed capital formation by the private sector is estimated according to the information obtained from the surveys conducted by Statistics South Africa for the various sectors of the economy (International Monetary Fund: 2016). Estimates of fixed capital expenditure on private residential buildings are calculated from Statistics South Africa's information of buildings completed, while outlays on machinery and transport equipment are verified from the South African Reserve Bank's balance of payments data. For public corporations, outlays on fixed capital formation are recorded from information obtained by the South African Reserve Bank from annual and quarterly surveys of the corporations. Estimates of fixed capital formation by the general government are obtained from analyses of the government finance statistics.

Estimates of consumption expenditure by general government on goods and services are compiled from Government Finance Statistics (GFS), analysis and Statistics South Africa publications (International Monetary Fund: 2016).

With regard to foreign trade, the South African Revenue Service (SARS) is the legislatively empowered controlling entity for statistics on the importation and exportation of goods. Trade statistics are published on the last business day of every month, for the previous month.

All of these bits and pieces of information arrive in different forms, at different time intervals. The national income accountants mix and match them together to produce estimates (it is not possible to compute exact values) of GDP on a quarterly basis (every three months). These numbers are then “annualized” by multiplying by four. As more information comes in, these estimates are updated and revised, often up to a year later.

When thinking about the demand for domestically produced goods in a global economy, it is important to count spending on exports—domestically produced goods that are sold abroad. By the same token, we must also subtract spending on imports—goods produced in other countries that are purchased by residents of this country. The net export component of GDP is equal to the Rand value of exports (X) minus the Rand value of imports (Z), $(X - Z)$. The gap between exports and imports is called the **trade balance**.

If a country's exports are larger than its imports, then a country is said to have a **trade surplus**.

Since the early 2000s, imports have typically exceeded exports, and so South Africa has experienced **trade deficits** in most years since then (Trading Economics: 2016). Indeed, the trade deficit deteriorated significantly after 2013. If exports and imports are equal, foreign trade has no effect on total GDP. However, even if exports and imports are balanced overall, foreign trade might still have powerful effects on particular industries and workers by causing nations to shift workers and physical capital investment toward one industry rather than another.

Based on these four components of demand, GDP can be measured as:

GDP = CONSUMPTION + INVESTMENT + GOVERNMENT + TRADE
BALANCE

$$\text{GDP} = C + I + G + (X - Z)$$

Understanding how to measure GDP is important for analyzing connections in the macro economy and for thinking about macroeconomic policy tools.

GDP Measured by What is Produced

Everything that is purchased must be produced first. Table 2 breaks down what is produced by the different production sectors in the economy: primary, secondary and tertiary. Note that the total gross value of production (R3,990,953m), adjusting for taxes and subsidies on products, is exactly the same as GDP at market prices measured by looking at the five components of expenditure/demand in Table 1. This helps us to understand a simple truth: the value of expenditure must always be approximately equal to the value of production.

Sector	Gross value added by kind of economic activity (Rm)	Percent of total
Primary sector	370 019	9
Secondary sector	736 051	18
Tertiary sector	2 454 488	62
Taxes on products	444 871	11
Subsidies on products	-14 476	
	3 990 953	

Table 2.South African GDP by sector in 2015
(South African Reserve Bank: 2016)

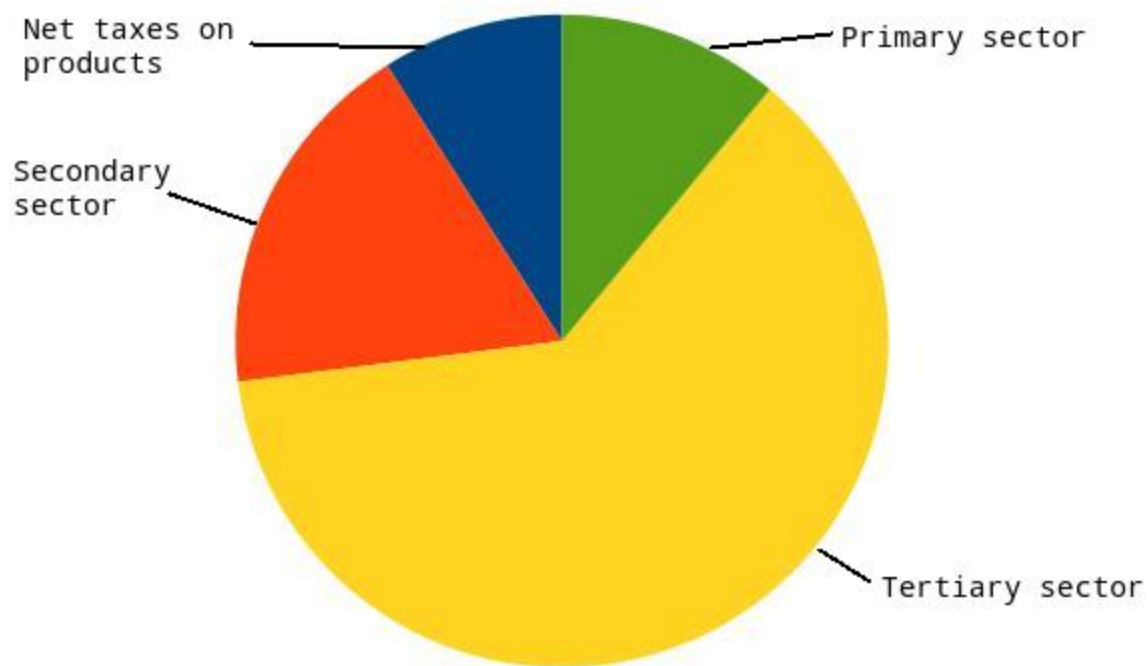


Figure 2.GDP by sector, 2015 (South African Reserve Bank: 2016)

Since every market transaction must have both a buyer and a seller, GDP must be the same whether measured by what is demanded/purchased or by what is produced.

In thinking about what is produced in the economy, many non-economists immediately focus on physical products such as crops or minerals (primary sector) or manufactured products such as clothing, cars and computers (secondary sector). By far the largest part of GDP, however, is services (tertiary sector). These include services such as schooling, healthcare, transport, financial services and many more. In addition, services have been a growing share of GDP over time in most countries. It has been decades since most of the South African economy involved making solid objects. Instead, the most common jobs in a modern economy involve a worker looking at pieces of paper or a computer screen; meeting with co-workers, customers, or suppliers; or making phone calls.

Three different ways of measuring GDP

We have observed from the circular flow model that economic activity consists, essentially, of just three interdependent flows: spending which gives rise to production which, in turn, yields income. One measure of the size of these flows is, as we have seen, GDP. We have also demonstrated that, whether one computes the value of **spending/expenditure** or the value of **production** which is the focus of the expenditure, it all amounts to the same thing: the value of spending must be the same as the value of production.

By the same token, goods and services sold by producers must bring in **income** equal in value to what consumers paid or spent on these items. So the value of spending on goods and services must be equal to the value of production which, in turn, must be equal to the value of income earned from the sale of these goods and services. Well, maybe not exactly. Remember that taxes on goods and services will make them more expensive (artificially increase their market "value") while subsidies for certain goods and services will reduce the market price or "value" of these items. However, if we make the necessary adjustments for taxes and subsidies, we should find that GDP can indeed be measured using any one of three methods: expenditure, production or income. All should give the same answer.

Table 3 shows the computation of GDP using the income method. So by adding up the income earned by the owners of the factors of production,

and adjusting for taxes and subsidies, we find that GDP calculated using the income approach is the same as GDP calculated using the expenditure or production methods. Compensation of employees refers to wages and salaries while net operating surplus is an umbrella category which records income to the owners of productive resources (including profit, rental income and interest). Consumption of fixed capital refers to the portion of income from production that must be used to replace depreciated (used up) capital i.e. machines, equipment, buildings etc.

	Value of income earned (Rm)
Compensation of employees	1 867 851
Net operating surplus	1 067 334
Consumption of fixed capital	553 222
Gross value added at factor cost	3 488 407
Other taxes on production	81 531
Less: other subsidies on production	9 380
Gross value added at basic prices	3 560 558
Taxes on products	444 871
Less: subsidies on products	14 476
GDP at market prices	3 990 953

Table 3. Computing GDP using the income approach (South African Reserve Bank: 2016)

The Problem of Double Counting

GDP is defined as the current value of all final goods and services produced in a nation in a year. What are final goods? They are goods at the furthest stage of production at the end of a year. Statisticians who calculate GDP must avoid the mistake of **double counting**, in which output is counted more than once as it travels through the stages of production. For example, imagine what would happen if government statisticians first counted the value of tyres produced by a tyre manufacturer, and then counted the value of a new truck sold by a truck manufacturer that contains those tyres. In this

example, the value of the tyres would have been counted twice—because the price of the truck includes the value of the tyres.

To avoid this problem, which would overstate the size of the economy considerably, government statisticians count just the value of **final goods and services** (or **value added**) in the chain of production that are sold for consumption, investment, government, and trade purposes. **Intermediate goods**, which are goods that go into the production of other goods, are excluded from GDP calculations. From the example above, only the value of the Ford truck will be counted. The value of what businesses provide to other businesses is captured in the final products at the end of the production chain.

The concept of GDP is fairly straightforward: it is just the Rand value of all final goods and services produced in the economy in a year. In our decentralized, market-oriented economy, actually calculating the roughly 4 trillion-Rand South African GDP—along with how it is changing every few months—is a full-time job for an army of government statisticians.

What is counted in GDP	What is not included in GDP
Consumption	Intermediate goods
Business investment	Transfer payments and non-market activities
Government spending on goods and services	Used goods
Net exports	Illegal goods

Table 4. Counting GDP

Notice the items that are not counted into GDP, as outlined in Table 4. The sales of used goods are not included because they were produced in a previous year and are part of that year's GDP. The entire underground economy of services paid “under the table” and illegal sales should be counted, but is not, because it is impossible to track these sales. Visser (2014) estimated that South Africa's informal economy contributes about

5% to the country's GDP (about R200 billion annually). Transfer payments, such as payment by the government to individuals (state pensions, grants and other welfare payments), are not included, because they do not represent production. Also, production of some goods/services—such as when you make your own breakfast, do your own laundry, fix your own car—is not counted because these goods are not sold in the marketplace.

Other measures of domestic economic activity

Measures of the levels of economic activity (by value) of a country are distorted by taxes on products and production and by subsidies on products and production. Taxes on products and production artificially inflate the market value of goods and services, while subsidies on products and production deflate their market value. By adjusting GDP at market prices to take account of taxes and subsidies on products and production, we can get a more precise estimate of the value and hence level of economic activity.

GDP at basic prices

We will start by adjusting GDP at market prices to take account of taxes and subsidies on products. This adjustment will give us the value of products based on "pure" or basic prices (prices that are not artificially inflated by taxes or artificially deflated by subsidies).

$$\text{GDP@basic prices} = \text{GDP@market prices} + \text{subsidies on products} - \text{taxes on products}.$$

Table 5 reflects the computation of South Africa's GDP at basic prices for 2015.

	Rm
GDP at market prices	3 990 953
Less: taxes on products	-444 871
Subsidies on products	14 476
Gross value added at basic prices	3 560 558

Table 5. GDP at basic prices (South African Reserve Bank: 2016)

GDP at factor cost

GDP@basic prices can be further refined to get the most accurate estimate possible of the true value or cost of production. GDP at factor cost is the true value of income earned by the factors of production uncomplicated by taxes or subsidies.

So even though GDP@basic prices accounts for taxes and subsidies on specific products, it does not take into consideration that production **processes** may be taxed or subsidised. Taxes on the production process, and subsidies benefiting producers will ultimately be reflected in prices and thus market value. Taxes on production, like taxes on specific products, will inflate prices and market value. Subsidies on production, like subsidies on specific products, will depress prices and market value. So to get a true picture of the real cost or value of production, we need to deduct from GDP@basic prices any taxes on production and add back the value of any subsidies on production.

$$\text{GDP@factor cost} = \text{GDP@basic prices} - \text{other taxes on production} + \text{other subsidies on production}$$

Table 6 reflects the computation of South Africa's GDP at factor cost for 2015.

	Rm
Gross value added at basic prices	3 560 558
Less: other taxes on production	-81 531
Other subsidies on production	9 380
Gross value added at factor cost	3 488 407

Table 6. GDP at factor cost (South African Reserve Bank: 2016)

Other Ways to Measure the Economy

Gross Domestic Expenditure

Besides GDP, there are several different but closely related ways of measuring the size of the economy. One of these that is of particular interest is Gross Domestic Expenditure (GDE). This measure gauges the strength of local or domestic spending and so excludes foreign spending on locally produced exports (exports). Thus GDE measures only domestic consumption spending (C), domestic investment spending (I) and government consumption expenditure (G). It is important to note that GDE includes spending on imports (Z) which may form part of domestic consumption, investment and government spending. GDE is calculated as:

Equation: $GDE = C + I + G$

Table 7 shows the calculation of South Africa's GDE for 2015.

	Rm
Final consumption expenditure by households	2 428 813
Final consumption expenditure by government	810 929
Gross capital formation (Investment)	778 571
Residual item	13 081
Gross Domestic Expenditure	4 031 394

Table 7. Gross Domestic Expenditure, 2015
(South African Reserve Bank: 2016)

We mentioned above that GDP can be thought of as total production or as total expenditure/purchases. It can also be thought of as total income since anything produced and sold produces income.

Gross National Income or Gross National Product

Another close cousin of gross domestic product (GDP) is the **gross national product (GNP)** or **gross national income (GNI)**. GDP includes only what is produced within a country's borders. GNP/GNI adds what is produced by domestic businesses and labor abroad, and subtracts out any

payments sent home to other countries by foreign labor and businesses located in South Africa. In other words, GNP is based more on the production of citizens and firms of a country, wherever they are located, and GDP is based on what happens within the geographic boundaries of a certain country. For South Africa, the gap between GDP and GNP is relatively small; in recent years, only about 2.5% of GDP (and GDP always tending to be greater than GNP in South Africa's case). For smaller and less developed economies such as Lesotho and Mocambique, for example, the difference can be substantial. The relationship between GDP and GNP/GNI is described by this equation:

Equation: $\text{GNP/GNI} = \text{GDP} + \text{primary income receipts from the rest of the world} - \text{primary income payments to the rest of the world}$

Table 8 shows the calculation of South Africa's GNP/GNI for 2015.

	Rm
GDP @ market prices	3 990 953
Primary income from the rest of the world	810 929
Less: primary income to the rest of the world	778 571
Gross National Income @ market prices	3 890 587

Table 8. Gross National Product/Income at market prices, 2015 (South African Reserve Bank: 2016)

Net National Product

Net national product (NNP) is calculated by taking GNP and then subtracting the value of how much physical capital is worn out, or reduced in value because of ageing, over the course of a year. The process by which capital ages and loses value is called **depreciation** or **consumption of fixed capital**. The NNP can be further subdivided into **national income**, which includes all income to businesses and individuals, and **personal income**, which includes only income to people. Table 9 computes South Africa's NNP for 2015.

	Rm
Gross National Income @ market prices	3 890 587
Less: Consumption of fixed capital	553 222
Net National Product or Net National Income	3 337 365

Table 9. Net National Product or Net National Income, 2015 (South African Reserve Bank: 2016).

It is important to be aware of the differences between the main national income accounts/statistics so that you do not accidentally compare, say, GDP in one year or for one country with GNP or NNP in another year or another country. To get an idea of how these calculations work, follow the steps in the following Work It Out feature.

Note:

Calculating GDP, Net Exports, and NNP

Based on the information in Table 10 for an imaginary small economy using Rands :

- What is the value of GDP?
- What is the value of net exports?
- What is the value of NNP?

Table 10 Imaginary data to calculate GDP and NNP

	Billions of Rands
Government consumption expenditure	120
Depreciation/consumption of fixed capital	40
Household consumption expenditure	400
Investment/gross capital formation	60
Exports	100
Imports	120
Income receipts from the rest of the world	10
Income payments to the rest of the world	8

Step 1. To calculate GDP use the following formula:

$GDP = \text{Consumption} + \text{Investment} + \text{Government spending} + (\text{Exports} - \text{Imports})$

$= C + I + G + (X - M)$

$R400bn + R60bn + R120bn + (R100 - R120)bn = R560 \text{ billion}$

Step 2. To calculate net exports, subtract imports from exports.

$\text{Net exports} = X - M = R100bn - R120bn = -R20 \text{ billion}$

Step 3. To calculate NNP, use the following formula:

$NNP = GDP + \text{Income receipts from the rest of the world} - \text{Income payments to the rest of the world} - \text{Depreciation}$

$R560bn + R10bn - R8bn - R40bn = R522 \text{ billion}$

Key Concepts and Summary

The size of a nation's economy is commonly expressed as its gross domestic product (GDP), which measures the value of the output of all goods and services produced within the country in a year. GDP is measured by taking the quantities of all goods and services produced, multiplying them by their prices, and summing the total. Since GDP measures what is bought and sold in the economy, it can be measured either by the sum of what is purchased in the economy or what is produced.

Expenditure or demand can be divided into consumption, investment, government, exports, and imports. What is produced in the economy can be divided into durable goods, nondurable goods, services, structures, and inventories. To avoid double counting, GDP counts only final output of

goods and services, not the production of intermediate goods or the value of labor in the chain of production.

Self-Check Questions

Exercise:

Problem:

Country A has export sales of R20 billion, government purchases of R1,000 billion, business investment is R50 billion, imports are R40 billion, and consumption spending is R2,000 billion. What is the Rand value of GDP?

Solution:

GDP is $C + I + G + (X - M)$. $GDP = R2,000 \text{ billion} + R50 \text{ billion} + R1,000 \text{ billion} + (R20 \text{ billion} - R40 \text{ billion}) = R3,030 \text{ billion}$

Exercise:

Problem:

Which of the following are included in GDP, and which are not?

- a. The cost of hospital stays
- b. The rise in life expectancy over time
- c. Child care provided by a licensed day care center
- d. Child care provided by a grandmother
- e. The sale of a used car
- f. The sale of a new car
- g. The greater variety of cheese available in supermarkets
- h. The iron that goes into the steel that goes into a refrigerator bought by a consumer.

Solution:

- a. Hospital stays are part of GDP.

- b. Changes in life expectancy are not market transactions and not part of GDP.
- c. Child care that is paid for is part of GDP.
- d. If Grandmother gets paid and reports this as income, it is part of GDP, otherwise not.
- e. A used car is not produced this year, so it is not part of GDP.
- f. A new car is part of GDP.
- g. Variety does not count in GDP, where the cheese could all be cheddar.
- h. The iron is not counted because it is an intermediate good.

Review Questions

Exercise:

Problem:

What are the main components of measuring GDP with reference to demand or expenditure?

Exercise:

Problem:

What are the main components of measuring GDP with reference to what is produced?

Exercise:

Problem:

Would you usually expect GDP as measured by what is demanded or spent to be greater than GDP measured by what is supplied/produced, or the reverse?

Exercise:

Problem:

Why must double counting be avoided when measuring GDP?

Critical Thinking Question

Exercise 7

What does GDP not tell us about the economy?

Problem

Exercise 8

Last year, a small nation with abundant forests cut down R200,000 worth of trees (natural forest). R100,000 worth of trees were then turned into R150,000 worth of timber (planks). R100, 000 worth of that timber was used to produce R250,000 worth of bookshelves. Assuming the country produces no other outputs, and there are no other inputs used in the production of trees, timber, and bookshelves, what is this nation's GDP? In other words, what is the value of the final goods produced including trees, timber and bookshelves?

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Glossary

depreciation

the process by which capital ages over time and therefore loses its value

double counting

a potential mistake to be avoided in measuring GDP, in which output is counted more than once as it travels through the stages of production

durable good

long-lasting good like a car or a refrigerator

final good and service

output used directly for consumption, investment, government, and trade purposes; contrast with "intermediate good"

gross domestic product (GDP)

the value of the output of all goods and services produced within a country in a year

gross national product (GNP)

includes what is produced domestically and what is produced by domestic labor and business abroad in a year

intermediate good

output provided to other businesses at an intermediate stage of production, not for final users; contrast with "final good and service"

inventory

good that has been produced, but not yet been sold

national income

includes all income earned: wages, profits, rent, and profit income

net national product (NNP)

GDP minus depreciation

nondurable good

short-lived good like food and clothing

service

product which is intangible (in contrast to goods) such as entertainment, healthcare, or education

structure

building used as residence, factory, office building, retail store, or for other purposes

trade balance

gap between exports and imports

trade deficit

exists when a nation's imports exceed its exports and is calculated as $\text{imports} - \text{exports}$

trade surplus

exists when a nation's exports exceed its imports and is calculated as $\text{exports} - \text{imports}$

Adjusting Nominal Values to Real Values

By the end of this section, you will be able to:

- Contrast nominal GDP and real GDP
- Explain GDP deflator
- Calculate real GDP based on nominal GDP values

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When examining economic statistics it is very important to distinguish between nominal and real measurements. You need to know whether or not inflation has distorted (given a false picture of) a given statistic. Looking at economic statistics without considering inflation is like looking through a pair of binoculars and trying to guess how close something is: unless you know how strong the lenses are, you cannot guess the distance very accurately. Similarly, if you do not know the rate of inflation, it is difficult to figure out if a rise in GDP is due mainly to a rise in the overall level of prices (inflation) or to a real rise in quantities of goods produced. The **nominal value** of any economic statistic means the statistic is measured in terms of actual prices that exist at the time. The **real value** refers to the same statistic after it has been adjusted for inflation. Generally, it is the real value that is more important.

Table 1, using a simple example of an economy with just two goods (chicken wings and burgers), shows nominal/current price as well as output data for each of three years.

Year	Price of chicken wings (8 wings)	Quantity of chicken wings (8 wings)	Price of burgers (R/burger)	Quantity of burgers (units)
2013	31	100	21	50
2014	33	150	22	100
2015	36	200	24	150

Table 1 . Current price and output data.

Nominal GDP

GDP is generally stated in current (nominal) prices and subsequently adjusted to account for the effects of inflation to reflect real GDP or GDP at constant prices. Table 2 shows the calculation of nominal GDP for each of the three years 2013-2015.

Year	Calculating nominal GDP
2013	$R31.00 \text{ per } 8 \text{ wing meals} \times 100 \text{ chicken wing meals} + (R21 \text{ per burger} \times 50 \text{ burgers}) = R4\,150$
2014	$R33.00 \text{ per } 8 \text{ wing meals} \times 150 \text{ chicken wing meals} + (R22 \text{ per burger} \times 100 \text{ burgers}) = R7\,150$
2015	$R36.00 \text{ per } 8 \text{ wing meals} \times 200 \text{ chicken wing meals} + (R24 \text{ per burger} \times 150 \text{ burgers}) = R10\,800$

Table 2. Calculating nominal GDP or GDP in current prices.

Converting Nominal to Real GDP

Nominal GDP is GDP measured at **current** market prices. Thus, nominal GDP will include all of the changes in market prices that have occurred during the current year due to inflation or deflation. Inflation is defined as a rise in the general price level, and deflation is defined as a fall in the general price level. In order to account for changes in the general price level, another measure of GDP called real GDP is often used. Real GDP is GDP evaluated at the market prices of some base year. For example, if 2013 were chosen as the base year, then real GDP for 2015 (or any subsequent year) is calculated by taking the quantities of all goods and services purchased or produced in 2015 (or subsequent years) and multiplying them by the historical prices of these goods and services in 2013. Real GDP is also termed **constant GDP** or GDP measured at **constant** prices.

Table 3 shows the calculation of real GDP for the Table 2 data.

Year	Calculating real GDP
2013	$R31.00 \text{ per } 8 \text{ wing meals} \times 100 \text{ chicken wing meals} + (R21 \text{ per burger} \times 50 \text{ burgers}) = R4\ 150$
2014	$R31.00 \text{ per } 8 \text{ wing meals} \times 150 \text{ chicken wing meals} + (R21 \text{ per burger} \times 100 \text{ burgers}) = R6\ 750$
2015	$R31.00 \text{ per } 8 \text{ wing meals} \times 200 \text{ chicken wing meals} + (R21 \text{ per burger} \times 150 \text{ burgers}) = R9\ 350$

Table 3. Calculating real GDP or GDP in constant prices.

The GDP deflator

Using the statistics on real GDP and nominal GDP, you can calculate an index of the price level for the year. This index called a GDP deflator can then be used as a conversion factor that transforms real GDP into nominal GDP. Note that in the chosen base year, real GDP is by definition equal to nominal GDP so that the GDP deflator in the base year is always equal to 100. This index - the GDP deflator - is given by the formula: $\text{GDP deflator} = (\text{nominal GDP} / \text{Real GDP}) \times 100$.

Table 4 shows South Africa's nominal GDP at five-year intervals since 1960 in nominal Rands (using an exchange rate of R15.22 per US Dollar). Thus GDP measured using the actual market prices prevailing in each stated year. This data is also reflected in the graph shown in Figure 1.

Year	Nominal GDP (R billions)	GDP deflator
1960	112.1	11.9
1965	167.5	12.8
1970	272.5	16.2
1975	562.3	28.0
1980	1225.3	52.5
1985	1020.7	40.8
1990	1704.9	62.8
1995	2366.1	83.5
2000	2075.4	63.8
2005	3392.3	100.0
2010	5712.8	125.0

Table 4. South Africa Nominal GDP, 2010
(adapted from Kolesnikov, 2016)

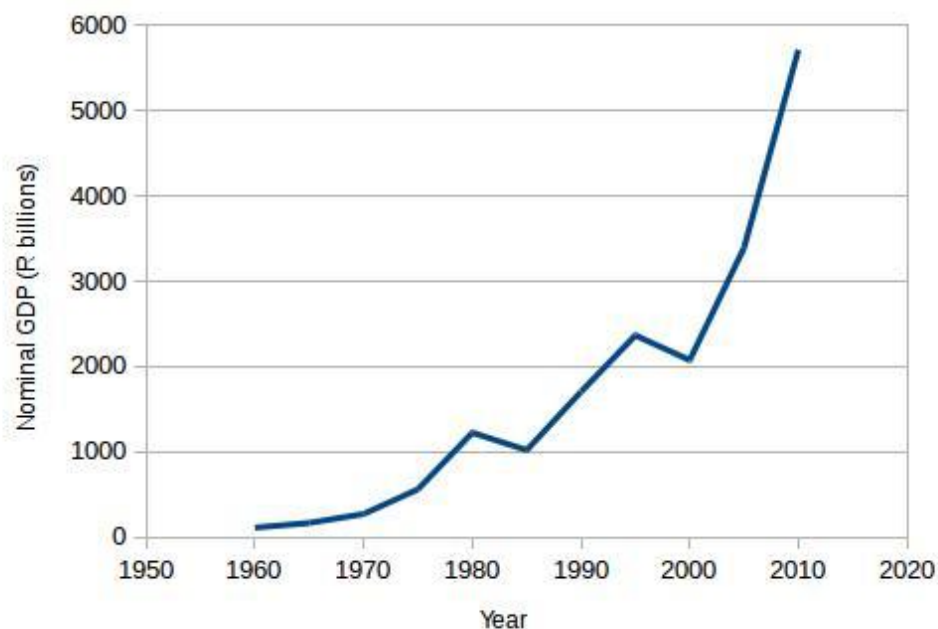


Figure 1. South Africa Nominal GDP, 1960 - 2010 (Source: Kolesnikov, 2016)

If an unwary analyst compared nominal GDP in 1960 to nominal GDP in 2010, it might appear that national output had risen by a factor of 51 over this time (that is, GDP of R5712 billion in 2010 divided by GDP of R112 billion in 1960). This conclusion would be highly misleading. Remember that nominal GDP is defined as the quantity of every good or service produced multiplied by the price at which it was sold, summed up for all goods and services. In order to see how much production has actually increased, we need to extract the effects of higher prices on nominal GDP. This can be easily done, using the GDP deflator.

GDP deflator is a price index measuring the average prices of all goods and services included in the economy. Later we will explore price indices in detail and how they are calculated in the [Inflation](#) section, but the above definition will do for this chapter. The data for the GDP deflator are given in Table 4 and shown graphically in Figure 2.

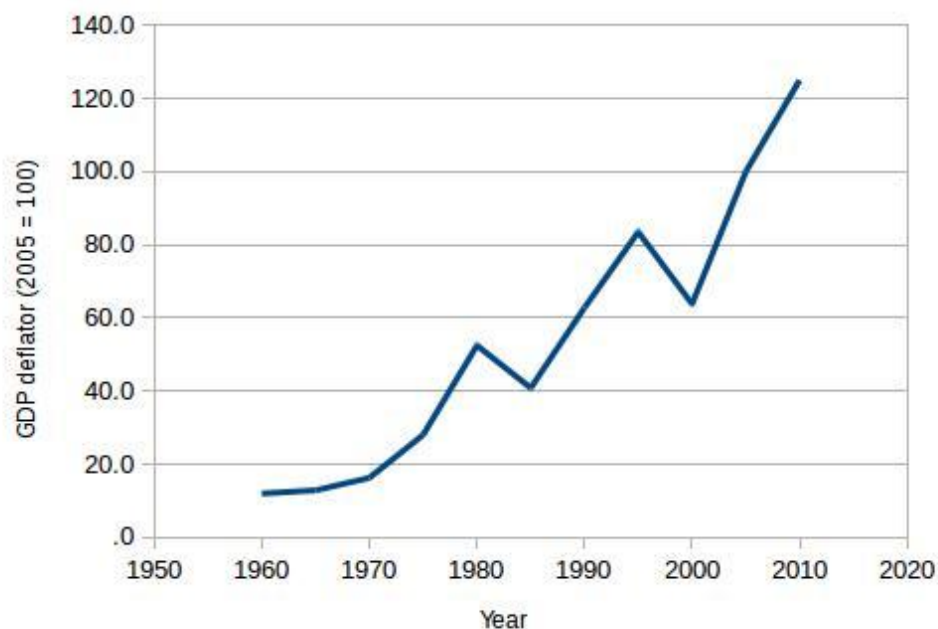


Figure 2. The GDP deflator follows the same trend as nominal GDP (Source: Kolesnikov, 2016)

The deflator (Figure 2) indicates that the general price level has risen dramatically since 1960. The price level in 2010 was almost eleven times higher than in 1960 (the deflator for 2010 was 125 versus a level of 11.9 in 1960). Clearly, much of the apparent growth in nominal GDP was due to inflation, not an actual change in the quantity of goods and services produced, in other words, not in real GDP. Recall that nominal GDP can rise for two reasons: an increase in output, and/or an increase in prices. What is needed is to extract the increase in prices from nominal GDP so as to measure only changes in output. After all, the Rands used to measure nominal GDP in 1960 are worth more than the inflated Rands of 2010—and the price index tells exactly how much more. This adjustment is easy to do if you understand that nominal measurements are in value terms, where

Equation:

$$\text{Value} = \text{Price} \times \text{Quantity}$$

or

$$\text{Nominal GDP} = \text{GDP Deflator} \times \text{Real GDP}$$

Let's look at an example at the micro level. Suppose the t-shirt company, Coolshirts, sells 100 t-shirts at a price of R90 each.

Equation:

$$\begin{aligned} \text{Coolshirt's nominal revenue from sales} &= \text{Price} \times \text{Quantity} \\ &= \text{R90} \times 10 \\ &= \text{R900} \end{aligned}$$

Then,

Equation:

$$\begin{aligned} \text{Coolshirt's real income} &= \frac{\text{Nominal revenue}}{\text{Price}} \\ &= \frac{\text{R900}}{\text{R90}} \\ &= 100 \end{aligned}$$

In other words, when we calculate “real” measurements we are trying to get at actual quantities, in this case, 100 t-shirts.

With GDP, it is just a tiny bit more complicated. We start with the same formula as above:

Equation:

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Index}}$$

For reasons that will be explained in more detail below, mathematically, a price index is a two-digit decimal number like 1.00 or 0.85 or 1.25. Because some people have trouble working with decimals, when the price index is published, it has traditionally been multiplied by 100 to get integer (whole) numbers like 100, 85, or 125. What this means is that when we “deflate”

nominal figures to get real figures (by dividing the nominal by the price index). We also need to remember to divide the published price index by 100 to make the math work. So the formula becomes:

Equation:

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Index} / 100}$$

Now read the following Work It Out feature for more practice calculating real GDP.

Note:

Calculating GDP

It is possible to use the data in Table 4 to calculate real GDP.

Step 1. Look at Table 4 to see that, in 1960, nominal GDP was R112.1 billion and the price index (GDP deflator) was 11.9.

Step 2. To calculate the real GDP in 1960, use the formula:

Equation:

$$\begin{aligned}\text{Real GDP} &= \frac{\text{Nominal GDP}}{\text{Price Index} / 100} \\ &= \frac{\text{R112.1 billion}}{11.9 / 100} \\ &= \text{R941.2 billion}\end{aligned}$$

We'll do this in two parts to make it clear. First adjust the price index: 11.9 divided by 100 = 0.119. Then divide into nominal GDP: R112.1 billion / 0.119 = R941.2 billion.

Step 3. Use the same formula to calculate the real GDP in 1965.

Equation:

$$\begin{aligned}\text{Real GDP} &= \frac{\text{Nominal GDP}}{\text{Price Index} / 100} \\ &= \frac{\text{R167.5 billion}}{12.8 / 100} \\ &= \text{R1, 308.6 billion}\end{aligned}$$

Step 4. Continue using this formula to calculate all of the real GDP values from 1960 through 2010. The calculations and the results are shown in Table 5.

Year	Nominal GDP (R billions)	GDP deflator	Calculations	Real GDP (2005 = 100, R billions)
1960	112.1	11.9	112.1/(11.9/100)	941.2
1965	167.5	12.8	167.5/(12.8/100)	1308.6
1970	272.5	16.2	272.5/(16.2/100)	1682.1
1975	562.3	28.0	562.3/(28/100)	2008.2
1980	1225.3	52.5	1225.3/(52.5/100)	2333.9
1985	1020.7	40.8	1020.7/(40.8/100)	2501.7
1990	1704.9	62.8	1704.9/(62.8/100)	2714.8
1995	2366.1	83.5	2366.1/(83.5/100)	2833.7
2000	2075.4	63.8	2075.4/(63.8/100)	3253.0
2005	3392.3	100.0	3392.3/(100/100)	3392.3
2010	5712.8	125.0	5712.8/(125/100)	4570.2

Table 5. Converting nominal to real GDP.
(Source: Kolesnikov, 2016)

There are a couple of things to notice here. Whenever you calculate a real statistic, one year (or period) plays a special role. It is called the base year (or base period). The base year is the year whose prices are used to compute the real statistic. When we calculate real GDP, for example, we take the quantities of goods and services produced in each year (for example, 1960 or 1973) and multiply them by their prices in the base year (in this example, 2005 is the base year), so we get a measure of GDP that uses prices that do not change from year to year. That is why real GDP is labelled “Constant Rands” or “2005 Rands,” which means that real GDP is constructed using prices that existed in 2005, that is GDP in constant (relative to 2005) prices. The formula used is:

Equation:

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

Rearranging the formula and using the data from 2005:

Equation:

$$\begin{aligned}
 \text{Real GDP} &= \frac{\text{Nominal GDP}}{\text{Price Index} / 100} \\
 &= \frac{\text{R3,392.3 billion}}{100 / 100} \\
 &= \text{R3,392.3 billion}
 \end{aligned}$$

Comparing real GDP and nominal GDP for 2005, you see they are the same. This is no accident. It is because 2005 has been chosen as the “base year” in this example. Since the price index in the base year always has a value of 100 (by definition), nominal and real GDP are always the same in the base year.

Look at the data for 2010.

Equation:

$$\begin{aligned}
 \text{Real GDP} &= \frac{\text{Nominal GDP}}{\text{Price Index} / 100} \\
 &= \frac{\text{R5,712.8 billion}}{125 / 100} \\
 &= \text{R4,570.2 billion}
 \end{aligned}$$

We can use this data to make another observation: As long as inflation is positive, meaning prices increase on average from year to year, real GDP should be less than nominal GDP in any year after the base year. The reason for this should be clear: The value of nominal GDP is “inflated” by inflation. Similarly, as long as inflation is positive, real GDP should be greater than nominal GDP in any year before the base year.

Figure 3 shows South Africa's nominal and real GDP since 1960. Because 2005 is the base year, the nominal and real values are exactly the same in that year. However, over time, the rise in nominal GDP looks much larger than the rise in real GDP (that is, the nominal GDP line rises more steeply than the real GDP line), because the rise in nominal GDP is exaggerated by the presence of inflation, especially in the 1970s.

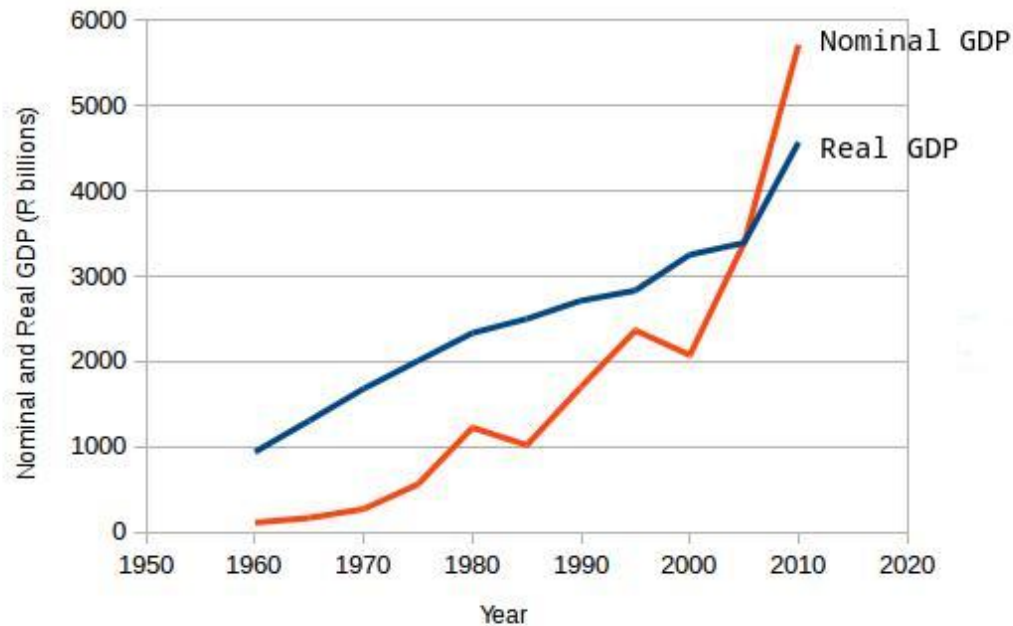


Figure 3. Real GDP is higher than nominal GDP before 2005 because Rands were worth more then than in 2005 and after. Following 2005 nominal GDP exceeds real GDP as one would expect due to inflation and the real value of these Rands is consequently lower as shown by the real GDP graph (Source: Kolesnikov, 2016).

Calculating economic growth

Let's return to the question posed originally: How much did GDP increase in real terms? To get a true picture of how much the economy has grown we need to calculate the increase in **real**, not nominal, GDP. What was the rate of growth of real GDP from 1960 to 2010? To find the real growth rate, we apply the formula for percentage change:

Equation:

$$\frac{2010 \text{ real GDP} - 1960 \text{ real GDP}}{1960 \text{ real GDP}} \times 100 = \% \text{ change}$$

$$\frac{4570.2 - 941.2}{941.2} \times 100 = 385.6\%$$

In other words, the South African economy has increased real production of goods and services by nearly a factor of four since 1960. Of course, that understates the material improvement since it fails to capture improvements in the quality of products and the invention of new products.

There is a quicker way to answer this question approximately, using another maths trick. Because:

Equation:

$$\text{Nominal} = \text{Price} \times \text{Quantity}$$

$$\% \text{ change in Nominal} = \% \text{ change in Price} + \% \text{ change in Quantity}$$

OR

$$\% \text{ change in Quantity} = \% \text{ change in Nominal} - \% \text{ change in Price}$$

Therefore, the growth rate of real GDP (% change in quantity) equals the growth rate in nominal GDP (% change in value) minus the inflation rate (% change in price).

Note that using this equation provides an approximation for small changes in the levels. For more accurate measures, one should use the first formula shown.

Key Concepts and Summary

The nominal value of an economic statistic is the commonly announced value (in newspapers and the media). The real value is the value after adjusting for changes in inflation. To convert nominal economic data from several different years into real, inflation-adjusted data, the starting point is to choose a base year arbitrarily (at random) and then use a price index to convert the measurements so that they are measured in the money prevailing in the base year.

Self-Check Question

Exercise:

Problem:

Using data from Table 5 how much of the nominal GDP growth from 1980 to 1990 was real GDP and how much was inflation?

Solution:

From 1980 to 1990, real GDP grew by $(2,714.8 - 2,333.9) / (2,333.9) = 16.3\%$. Over the same period, prices increased by $(62.8 - 52.5) / (52.5) = 19.6\%$. So about 55% of the growth $[19.6 / (16.3 + 19.6)]$ was inflation, and the remainder: $16.3 / (16.3 + 19.6) = 45\%$ was growth in real GDP.

Review Questions**Exercise:****Problem:**

What is the difference between a series of economic data over time measured in nominal terms versus the same data series over time measured in real terms?

Exercise:**Problem:**

How do you convert a series of nominal economic data over time to real terms?

Critical Thinking Question**Exercise:**

Problem:

Should people typically pay more attention to their real income or their nominal income? If you choose the latter, why would that make sense in today's world? Would your answer be the same for the 1970s?

Problems**Exercise:****Problem:**

The “prime” interest rate is the rate that banks charge their best customers. Based on the nominal interest rates and inflation rates given in Table 6, in which of the years given would it have been best to be a lender? Based on the nominal interest rates and inflation rates given in Table 6, in which of the years given would it have been best to be a borrower?

Year	Prime interest rate	Inflation rate
1970	7.9%	5.7%
1974	10.8%	11.0%
1978	9.1%	7.6%
1981	18.9%	10.3%

Table 6. Prime interest and inflation rates for selected years.

Exercise:

Problem:

A mortgage loan is a loan that a person makes to purchase a house. Table 7 provides a list of the mortgage or home loan interest rates being charged for several different years and the rate of inflation for each of those years. In which years would it have been better to be a person borrowing money from a bank to buy a home? In which years would it have been better to be a bank lending money?

Year	Mortgage/home loan Interest Rate	Inflation Rate
1984	12.4%	4.3%
1990	10%	5.4%
2001	7.0%	2.8%

Table 7. Mortgage or home loan interest and inflation rates for selected years.

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<http://southafrica.opendataforafrica.org/mhrzolg/gdp-statistics-from-the-world-bank?country=South%20Africa> (Accessed: 20 July 2016)

Glossary

nominal value

the economic statistic actually announced at that time, not adjusted for inflation; contrast with real value

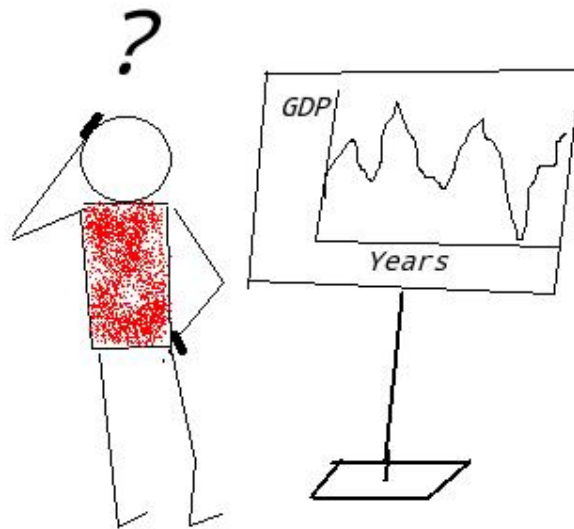
real value

an economic statistic after it has been adjusted for inflation; contrast with nominal value

Tracking Real GDP over Time

By the end of this section, you will be able to:

- Explain recessions, depressions, peaks, and troughs
- Evaluate the importance of tracking real GDP over time
- Analyze the impact of economic fluctuations on a country's output and price level



*Alex vd Merwe
27/06/2017*

Figure 1.

When news reports indicate that “the economy grew 1.2% in the first quarter,” the reports are referring to the percentage change in real GDP. By convention, GDP growth is reported at an annualized rate: Whatever the calculated growth in real GDP was for the quarter (the three months in question), it is multiplied by four (there are four quarters in a year) when it is reported as if the economy were growing at that rate for a full year.

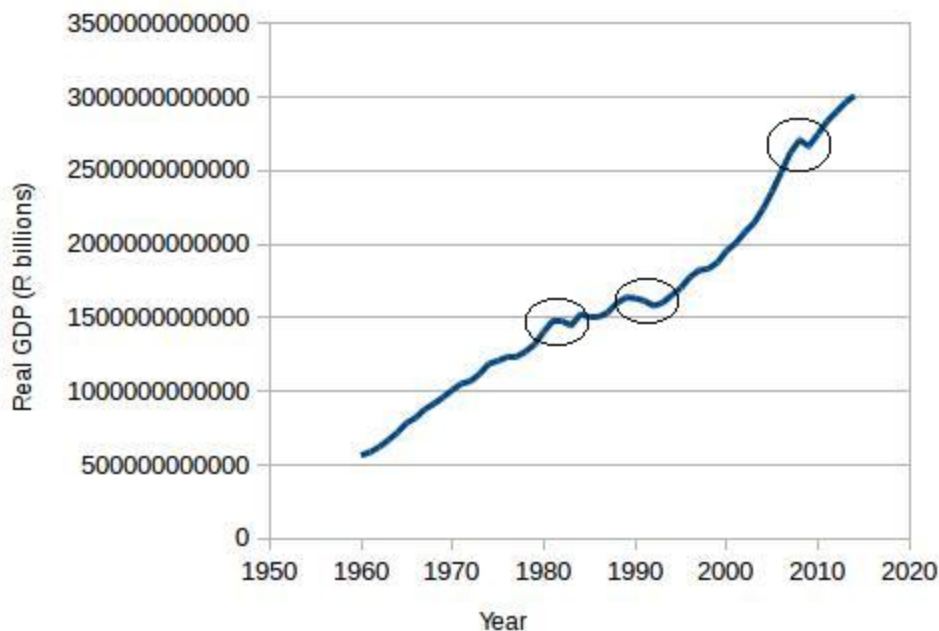


Figure 2. Removing the effects of inflation, South Africa's Real GDP (the production of physical goods and services) in 2014 was about six times bigger than in 1960. (Source: South Africa Data Portal, 2016)

Figure 2 shows the pattern of South African real GDP (base year = 2005) since 1960. The generally upward long-term path of GDP has been regularly interrupted by short-term declines. A significant decline in real GDP is called a **recession**. An especially lengthy and deep recession is called a **depression**. Notable declines in real GDP which occurred in the early-to-mid '80's, early '90's and again in 2008-2009 are circled in Figure 2.

Real GDP is important because it is highly correlated with other measures of economic activity, like employment and unemployment. When real GDP rises, so does employment.

The most significant human problem associated with recessions (and their larger, uglier cousins, depressions) is that a slowdown in production means that firms need to lay off or fire some of the workers they have. Losing a job imposes painful financial and personal costs on workers, and often on their extended families as well. In addition, even those who keep their jobs are likely to find that wage increases are small at best—or they may even be asked to take pay cuts.

The fluctuations of real GDP over time can be plotted as a line chart as in Figure 3. The highest point of the economy, before the recession begins, is called the **peak**; conversely, the lowest point of a recession, before a recovery begins, is called the **trough**. Thus, a recession lasts from peak to trough, and an economic expansion or upswing runs from trough to peak. The movement of the economy from peak to trough and trough to peak is called the **business cycle**. The durations of the various phases of the business cycle tend to be irregular and may last from six months or a year to several years. Nobody knows for sure why they occur and why these patterns repeat themselves over time.

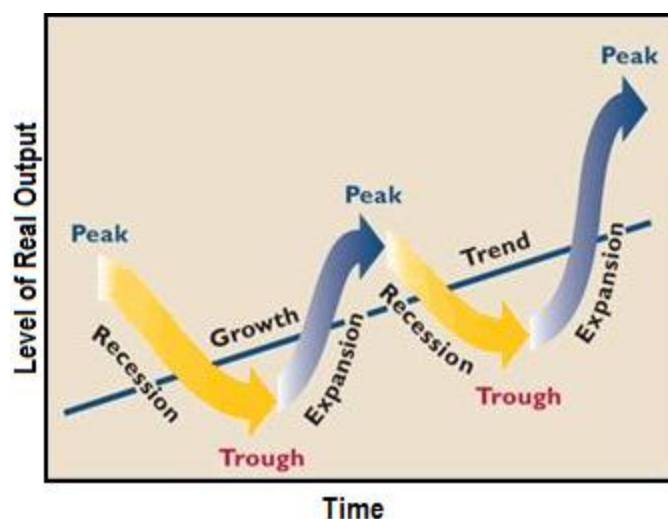


Figure 3. A simplified sketch of the business

cycle showing its four phases (Source: FactReal, 2013)

Key Concepts and Summary

Over the long term, South African real GDP has increased dramatically. At the same time, GDP has not increased the same amount each year. The speeding up and slowing down of GDP growth represents the business cycle. When GDP declines significantly, a recession occurs. A longer and deeper decline is a depression. Recessions begin at the peak of the business cycle and end at the trough.

Self-Check Questions

Exercise:

Problem:

Revisit Figure 2. Can you identify any periods other than the three circled recessions in which South African economic growth slowed down or even stopped. What would have been the consequences of this (This requires a judgement call.)

Solution:

Economic growth slowed down and levelled out to some extent in the late 1970's, late 1980's and then again in the late 1990's. This would have resulted in slowing employment and rising unemployment as firms laid off workers (due to falling sales and production) which, in turn, would have increased poverty levels.

Critical Thinking Questions

Exercise 2

Why do you suppose that South Africa's GDP is so much higher today than 50 or 100 years ago?

Exercise 3

Why do you think that GDP does not grow at a steady rate, but rather speeds up and slows down?

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[Graphic of the Business Cycle] In: Obama's is the worst economic recovery in history. FactReal, February 16, 2013. Available: <https://factreal.wordpress.com/2013/02/16/obamas-is-the-worst-economic-recovery-in-history-graph-gdp-data/> (Accessed: 20 July 2016)

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Glossary

business cycle

the relatively short-term movement of the economy in and out of recession

depression

an especially lengthy and deep decline in output

peak

during the business cycle, the highest point of output before a recession begins

recession

a significant decline in national output

trough

during the business cycle, the lowest point of output in a recession, before a recovery begins

Comparing GDP among Countries

By the end of this section, you will be able to:

- Explain how GDP can be used to compare the economic welfare of different nations
- Calculate the conversion of GDP to a common currency by using exchange rates
- Calculate GDP per capita using population data



Figure 1.

It is common to use GDP as a measure of economic welfare or standard of living in a nation. When comparing the GDP of different nations for this purpose, two issues immediately arise. First, the GDP of a country is measured in its own currency: South Africa uses its Rand (ZAR), the United States uses the U.S. dollar; Canada, the Canadian dollar; most countries of Western Europe, the euro; Japan, the yen; Mexico, the peso; and so on. Thus, comparing GDP between two countries requires converting to a common currency. A second issue is that countries have very different numbers of people. For instance, the United States has a much larger economy than South Africa's, but it also has roughly six times

as many people as South Africa has. So, if we are trying to compare standards of living across countries, we need to divide GDP by population.

Converting Currencies with Exchange Rates

To compare the GDP of countries with different currencies, it is necessary to convert to a “common denominator” using an **exchange rate**, which is the value of one currency in terms of another currency. Exchange rates are expressed either as the units of country A’s currency that need to be traded for a single unit of country B’s currency (for example, Japanese yen per British pound), or as the inverse (for example, British pounds per Japanese yen). Two types of exchange rates can be used for this purpose, market exchange rates or purchasing power parity (PPP) equivalent exchange rates. Market exchange rates vary on a day-to-day basis depending on supply and demand in foreign exchange markets. PPP-equivalent exchange rates provide a longer run measure of the exchange rate. For this reason, PPP-equivalent exchange rates are typically used for cross country comparisons of GDP. Exchange rates will be discussed in more detail later. The following Work It Out feature explains how to convert GDP to a common currency.

Note:

Converting GDP to a Common Currency

Using the exchange rate to convert GDP from one currency to another is straightforward. Say that the task is to compare South Africa's GDP in 2013 of 2.9 trillion Rands with the U.S. GDP of \$15.9 trillion for the same year.

Step 1. Determine the exchange rate for the specified year. In 2013, the average exchange rate was about \$1 = R9.50 (Rand vs the Dollar in 2013: 2014). (These numbers are realistic, but rounded off to simplify the calculations.)

Step 2. Convert South Africa's GDP into U.S. dollars:

Equation:

$$\begin{aligned}\text{South Africa's GDP in \$ U.S.} &= \frac{\text{South Africa's GDP in Rands}}{\text{Exchange rate (Rands/\$ U.S.)}} \\ &= \frac{2.9 \text{ trillion Rands}}{9.50 \text{ Rands per \$ U.S.}} \\ &= \$0.31 \text{ trillion (or \$310 billion)}\end{aligned}$$

Step 3. Compare this value to the GDP in the United States in the same year. The U.S. GDP was \$15.9 trillion in 2013, which is about 50 times bigger than South

Africa's GDP in 2013.

Step 4. View Table 1 which shows the size of and variety of GDPs of different countries in 2013, all expressed in U.S. dollars. Each is calculated using the process explained above.

Country	GDP in Billions of Domestic Currency		Domestic Currency/U.S. Dollars (PPP Equivalent)	GDP (in billions of U.S. dollars)
Brazil	4,844.80	reals	2.157	2,246.00
Canada	1,881.20	dollars	1.030	1,826.80
China	58,667.30	yuan	6.196	9,469.10
Egypt	1,753.30	pounds	6.460	271.40
Germany	2,737.60	euros	0.753	3,636.00
India	113,550.70	rupees	60.502	1,876.80
Japan	478,075.30	yen	97.596	4,898.50
Mexico	16,104.40	pesos	12.772	1,260.90
South Korea	1,428,294.70	won	1,094.925	1,304.467
United Kingdom	1,612.80	pounds	0.639	2,523.20
United States	16,768.10	dollars	1.000	16,768.10

Comparing GDPs Across Countries, 2013 (Source: International Monetary Fund)

Comparing GDPs Across Countries, 2013 (Source: International Monetary Fund, 2013 <http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/index.aspx>)

GDP Per Capita

The United States economy has the largest GDP in the world, by a considerable amount. The United States is also a populous country; in fact, it is the third largest country by population in the world, although well behind China and India. So is the U.S. economy larger than other countries just because the United States has more people than most other countries, or because the U.S. economy is actually larger on a per-person basis? This question can be answered by calculating a country's **GDP per capita**; that is, the GDP divided by the population.

Equation:

$$\text{GDP per capita} = \text{GDP} / \text{population}$$

The second column of Table 2 lists the GDP of the same selection of countries that appeared in Table 1, showing their GDP as converted into U.S. dollars (which is the same as the last column of the previous table). The third column gives the population for each country. The fourth column lists the GDP per capita (per person). GDP per capita is obtained in two steps: First, by multiplying column two (GDP, in billions of dollars) by 1000 so it has the same units as column three (Population, in millions). Then dividing the result (GDP in millions of dollars) by column three (Population, in millions).

Country	GDP (in billions of U.S. dollars)	Population (in millions)	Per Capita GDP (in U.S. dollars)
Brazil	2,246.00	199.20	11,172.50
Canada	1,826.80	35.10	52,037.10

Country	GDP (in billions of U.S. dollars)	Population (in millions)	Per Capita GDP (in U.S. dollars)
China	9,469.10	1,360.80	6,958.70
Egypt	271.40	83.70	3,242.90
Germany	3,636.00	80.80	44,999.50
India	1,876.80	1,243.30	1,509.50
Japan	4,898.50	127.3	38,467.80
Mexico	1,260.90	118.40	10,649.90
South Korea	1,304.47	50.20	25,975.10
United Kingdom	2,523.20	64.10	39,371.70
United States	16,768.10	316.30	53,001.00

GDP Per Capita, 2013(Source: International Monetary Fund: 2013
<http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/index.aspx>)

By comparison, South Africa's GDP per capita in 2013 in US Dollar terms was \$311 billion/52.98 million = \$5,870/person (Statistics South Africa, 2013). This rough measure suggests that the average South African was better off than the average Egyptian in 2013 but worse off than the average Chinese.

Notice that the ranking by GDP is different from the ranking by GDP per capita. India has a somewhat larger GDP than Germany, but on a per capita basis, Germany has more than 10 times India's standard of living. Will China soon have a better standard of living than the U.S.? Read the following Clear It Up feature to find out.

Note:

Is China going to surpass the United States in terms of standard of living?

As shown in Table 2, China has the second largest GDP of the countries: \$9.5 trillion compared to the United States' \$16.8 trillion. Perhaps it will surpass the United States, but probably not any time soon. China has a much larger population so that in per capita terms, its GDP is less than one fifth that of the United States (\$6,958.70 compared to \$53,001). The Chinese people are still quite poor relative to the United States and other developed countries. Please note however: for reasons to be discussed shortly, GDP per capita can give us only a rough idea of the differences in living standards between countries.

The high-income nations of the world—including the United States, Canada, the Western European countries, and Japan—typically have GDP per capita in the range of \$20,000 to \$50,000. Middle-income countries, which include much of Latin America, Eastern Europe, and some countries in East Asia, have GDP per capita in the range of \$6,000 to \$12,000. The low-income countries in the world, many of them located in Africa and Asia, often have GDP per capita of less than \$2,000 per year.

Key Concepts and Summary

Since GDP is measured in a country's currency, in order to compare different countries' GDPs, we need to convert them to a common currency. One way to do that is with the exchange rate, which is the price of one country's currency in terms of another. Once GDPs are expressed in a common currency, we can compare each country's GDP per capita by dividing GDP by population. Countries with large populations often have large GDPs, but GDP alone can be a misleading indicator of the wealth of a nation. A better measure is GDP per capita but even this is a rough and imperfect measure of the wealth of a country.

Self-Check Question

Exercise:**Problem:**

Is it possible for GDP to rise while at the same time per capita GDP is falling? Is it possible for GDP to fall while per capita GDP is rising?

Solution:

Yes. The answer to both questions depends on whether GDP is growing faster or slower than population. If population grows faster than GDP, GDP increases, while GDP per capita decreases. If GDP falls, but population falls faster, then GDP decreases, while GDP per capita increases.

Exercise:**Problem:**

The Central African Republic has a GDP of 1,107,689 million CFA francs and a population of 4.862 million. The exchange rate is 284.681 CFA francs per dollar. Calculate the GDP per capita of Central African Republic in US Dollars.

Solution:

Start with Central African Republic's GDP measured in francs. Divide it by the exchange rate to convert to U.S. dollars, and then divide by population to obtain the per capita figure. That is, $1,107,689 \text{ million francs} / 284.681 \text{ francs per dollar} / 4.862 \text{ million people} = \$800.28 \text{ GDP per capita}$.

Review Question**Exercise:****Problem:**

What are the two main difficulties that arise in comparing the GDP of different countries?

Critical Thinking Question**Exercise:**

Problem:

Cross country comparisons of GDP per capita typically use purchasing power parity equivalent exchange rates, which are a measure of the long run equilibrium value of an exchange rate. In fact, we used PPP equivalent exchange rates in this module. Why could using market exchange rates, which sometimes change dramatically in a short period of time, be misleading?

Exercise:**Problem:**

Why might per capita GDP be only an imperfect measure of a country's standard of living?

Problems**Exercise:****Problem:**

Ethiopia has a GDP of \$8 billion (measured in U.S. dollars) and a population of 55 million. Costa Rica has a GDP of \$9 billion (measured in U.S. dollars) and a population of 4 million. Calculate the per capita GDP for each country and identify which one is higher.

Exercise:**Problem:**

In 1980, Denmark had a GDP of \$70 billion (measured in U.S. dollars) and a population of 5.1 million. In 2000, Denmark had a GDP of \$160 billion (measured in U.S. dollars) and a population of 5.3 million. By what percentage did Denmark's GDP per capita rise between 1980 and 2000?

Exercise:**Problem:**

The Czech Republic has a GDP of 1,800 billion koruny. The exchange rate is 20 koruny/U.S. dollar. The Czech population is 10 million. What is the GDP per capita of the Czech Republic expressed in U.S. dollars?

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Glossary

exchange rate

the price of one currency in terms of another currency

GDP per capita

GDP divided by the population

How Well GDP Measures the Well-Being of Society

By the end of this section, you will be able to:

- Discuss how productivity influences the standard of living
- Explain the limitations of GDP as a measure of the standard of living
- Analyze the relationship between GDP data and fluctuations in the standard of living

[missing_resource: happyman.jpeg] **Figure 1.**

The level of GDP per capita clearly captures some of what we mean by the phrase “standard of living.” Most of the migration in the world, for example, involves people who are moving from countries with relatively low GDP per capita to countries with relatively high GDP per capita.

“Standard of living” is a broader term than GDP. While GDP focuses on production that is bought and sold in markets, **standard of living** includes all elements that affect people’s well-being, whether they are bought and sold in the market or not. To illuminate the gap between GDP and standard of living, it is useful to spell out some things that GDP does not cover that are clearly relevant to standard of living.

Limitations of GDP as a Measure of the Standard of Living

While GDP includes spending on recreation and travel, it does not cover leisure time. Clearly, however, there is a substantial difference between an economy that is large because people work long hours, and an economy that is just as large because people are more productive with their time so they do not have to work as many hours. In 2015 the GDP per capita of the South African economy was over four times larger than the GDP per capita of Cote d'Ivoire (World Bank: 2016) but does that prove that the standard of living in South Africa is higher than in Cote d' Ivoire? Not necessarily, since it is also true that the average South African worker works more hours more per year more than the average Ivorian worker. The calculation of

GDP does not take the Ivorian worker's extra weeks of vacation into account.

While GDP includes what is spent on environmental protection, healthcare, and education, it does not include actual levels of environmental cleanliness, health, and learning. GDP includes the cost of buying pollution-control equipment, but it does not address whether the air and water are actually cleaner or dirtier. GDP includes spending on medical care, but does not address whether life expectancy or infant mortality have risen or fallen. Similarly, it counts spending on education, but does not address directly how much of the population can read, write, or do basic mathematics.

GDP includes production that is exchanged in the market, but it does not cover production that is not exchanged in the market. For example, hiring someone to look after an elderly parent, clean your house or service your car is part of GDP, but doing these tasks yourself is not part of GDP. A remarkable change in many economies in recent decades is the increase in the number of women entering the workforce. This is a development that started in the late 19th century and steadily progressed through the two World Wars (during these wars women were employed in factories instead of men who were away in the war). The employment of women gained dramatic momentum during the 1970's and this global trend continues today (Women in the workforce: 2016). As more women are now in the labor force, many of the services they used to produce in the non-market economy like food preparation and child care have shifted to some extent into the market economy, which makes the GDP appear larger even if more services are not actually being consumed.

GDP has nothing to say about the level of inequality in society. GDP per capita is only an average. When GDP per capita rises by 5%, it could mean that GDP for everyone in the society has risen by 5%, or that of some groups has risen by more while that of others has risen by less—or even declined. GDP also has nothing in particular to say about the amount of variety of goods and services available. If a family buys 100 loaves of bread in a year, GDP does not care whether they are all white bread, or whether the family can choose from brown, whole wheat, rye, fancy loaf, vitamin

enriched and many others—it just looks at whether the total amount spent on bread is the same.

Likewise, GDP has nothing much to say about what technology and products are available. The standard of living in, for example, 1950 or 1900 was not affected only by how much money people had—it was also affected by what they could buy. No matter how much money you had in 1950, you could not buy a cell phone or tablet computer.

In certain cases, it is not clear that a rise in GDP is even a good thing. If a city experiences fire, flood or storm damage, for example, and as a result then has a surge of rebuilding construction activity, it would be strange to claim that the fire, flood or storms were therefore economically beneficial. If people are led by a rising fear of crime, to pay for installation of burglar bars, security fences, and alarms on all their windows, it is not correct to regard this increase in GDP as improving people's standard of living. In the same way, many people would argue that sales of certain goods, like pornography, drugs, alcohol, tobacco or extremely violent movies, although adding to GDP - do not represent an improvement to society's standard of living.

Does a Rise in GDP Overstate or Understate the Rise in the Standard of Living?

The fact that GDP per capita does not fully capture the broader idea of standard of living has led to a concern that the increases in GDP over time can give a false impression of the health of the economy and/or the standard of living enjoyed by societies. It is theoretically possible that while GDP is rising, the standard of living could be falling if human health, environmental pollution, and other factors that are not included in GDP are worsening. Fortunately, this fear appears to be overstated.

In some ways, the rise in GDP understates the actual rise in the standard of living. For example, the typical workweek for the average worker has fallen over the last century from about 60 hours per week to less than 40 hours per week (Working time: 2016). Life expectancy and health have risen dramatically, and so has the average level of education and basic services

provision especially since the inception of South Africa's democratic political dispensation in 1994. New technologies have been developed for entertainment, travel, information, and health. A much wider variety of basic products like food and clothing is available today than several decades ago. Because GDP does not capture leisure, health, the quality of the environment, the possibilities created by new technology, or an increase in variety, the actual rise in the standard of living of South Africans in recent decades has exceeded the rise in GDP.

On the other hand, rates of crime, levels of traffic congestion, threats to the environment and inequality of incomes are higher in South Africa now than they were in the 1960s. Moreover, a substantial number of services that used to be provided, primarily by women in the non-market economy are now part of the market economy (have to be paid for) and that is counted by GDP. By ignoring these factors then, GDP would tend to overstate the true rise in the standard of living. (The rise in standard of living is not as large as GDP suggests)

Note:

Visit this [website](#) to read about the American Dream and standards of living. Then compare it with this Facebook post about the South African dream [website](#) and what matters to South Africans.



GDP is Rough, but Useful

A high level of GDP should not be the only goal of macroeconomic policy, or government policy more broadly. Even though GDP does not measure the broader standard of living with any precision, it does measure production well and it does indicate when a country is materially better or worse off in terms of jobs and incomes. In most countries, a significantly higher GDP per capita occurs hand in hand with other improvements in everyday life along many dimensions, like education, health, and environmental protection.

No single number can capture all the elements of a term as broad as “standard of living.” Nonetheless, GDP per capita is a reasonable, rough-and-ready measure of the standard of living.

Note:**How is the Economy Doing? How Does One Tell?**

To determine the state of the economy, one needs to examine economic indicators, such as GDP. To calculate GDP is quite an undertaking. It is the broadest measure of a nation’s economic activity and we owe a debt to Simon Kuznets, the creator of the measurement, for that.

The size of the South African economy as measured by GDP (about 4.7 trillion Rands in 2015) is the second largest on the African continent after Nigeria (Kolesnikov: 2016). Real GDP informed us that the recession of 2008–2009 was a severe one and that the recovery from that has been slow even seven years later in 2016. GDP per capita gives a rough estimate of a nation’s standard of living. This chapter is the building block for other chapters that explore more economic indicators such as unemployment, inflation, or interest rates, and perhaps more importantly, will explain how they are related and what causes them to rise or fall.

Key Concepts and Summary

GDP is an indicator of a society’s standard of living, but it is only a rough indicator. GDP does not directly take account of leisure, environmental quality, levels of health and education, activities conducted outside the

market, changes in inequality of income, increases in variety, increases in technology, or the (positive or negative) value that society may place on certain types of output.

Self-Check Question

Exercise:

Problem:

Explain briefly whether each of the following would cause GDP to overstate or understate the degree of change in the broad standard of living.

- a. The environment becomes more polluted
- b. The crime rate declines
- c. A greater variety of goods become available to consumers
- d. Infant mortality declines

Solution:

- a. A polluted environment (such as poor air quality, rivers full of factory waste) would reduce the broad standard of living, but not be counted in GDP, so a rise in GDP would overstate the standard of living.
- b. A lower crime rate would raise the broad standard of living, but not be counted directly in GDP, and so a rise in GDP would understate the standard of living.
- c. A greater variety of goods would raise the broad standard of living, but not be counted directly in GDP, and so a rise in GDP would understate the rise in the standard of living.
- d. A decline in infant mortality would raise the broad standard of living, but not be counted directly in GDP, and so a rise in GDP would understate the rise in the standard of living.

Review Question

Exercise:

Problem:

List some of the reasons why GDP should not be considered an effective measure of the standard of living in a country.

Critical Thinking Questions

Exercise:

Problem: How might a “green” GDP be measured?

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Glossary

standard of living

all elements that affect people's happiness, whether these elements are bought and sold in the market or not

Introduction to Unemployment

class="introduction"



Figure 1. A common scene in too many South African cities and towns. (Credit: agenzia fides)

Note:

A most pressing problem

A million jobs were lost in South Africa following the Great Recession of 2008-2009 (Lowman, 2016). Since then the ranks of the unemployed have continued to grow with over 1.2 million extra unemployed since the first quarter of 2010. This is a result of ongoing job-losses as well as a constant swelling of the labor pool with new entrants that cannot find a job. In 2016 the official rate of unemployment stood at 26.7% (Lowman, 2016). With the economy growing, albeit very slowly, why is the rate of unemployment not coming down? Why are firms not hiring?

These questions lead us to the topic of this chapter—unemployment.

What constitutes it? How is it measured? And if the economy is growing, why isn't the pool of job openings growing along with it?

Note:**Introduction to Unemployment**

In this chapter, you will learn about:

- How the Unemployment Rate is Defined and Computed
- Patterns of Unemployment
- What Causes Changes in Unemployment over the Short Run
- What Causes Changes in Unemployment over the Long Run

Unemployment can be a terrible and disruptive life experience—like a serious car accident or a messy divorce—whose consequences can be fully understood only by someone who has gone through it. For unemployed individuals and their families, there is the day-to-day financial stress of not knowing where the next paycheck is coming from. There are painful adjustments, like watching your savings account dwindle, selling a car and buying a cheaper one, or moving to a less expensive place to live. Even when the unemployed person finds a new job, it may pay less than the previous one. For many people, their job is an important part of their self worth. When unemployment separates people from the workforce, it can affect family relationships as well as mental and physical health.

The human costs of unemployment alone would justify making a low level of unemployment an important public policy priority. But unemployment also includes economic costs to the broader society. When millions of unemployed but willing workers cannot find jobs, an economic resource is going unused. An economy with high unemployment is like a company operating with a functional but unused factory. The opportunity cost of unemployment is the output that could have been produced by the unemployed workers.

This chapter will discuss how the unemployment rate is defined and computed. It will examine the patterns of unemployment over time, for the South African economy as a whole, for different demographic groups in the South African economy, and for other countries. It will then consider possible economic explanations for local unemployment, and how these

explain the patterns of unemployment and suggests public policies for reducing it.

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How the Unemployment Rate is Defined and Computed

By the end of this section, you will be able to:

- Calculate the labor force percentage and the unemployment rate
- Explain hidden unemployment and what it means to be in or out of the labor force
- Evaluate the collection and interpretation of unemployment data



Alex vd Merwe
31/01/2017

Figure 1 Looking for work

Unemployment is usually described in newspaper or television reports as a percentage or a rate. A recent report might have said, for example, *from August 2009 to November 2009, the South African unemployment rate rose from 23.5% to 24.1%, but by June 2010, it had fallen to 23.8%. At a glance,*

the changes between the percentages may seem small. But remember that the South African economy has nearly 15 million adults who either have jobs or are looking for them (South Africa labor force participation rate: 2016). A rise or fall of just 0.1% in the unemployment rate of 15 million potential workers translates into 15,000 people, which is roughly the population of some small towns. Large rises in the unemployment rate mean large numbers of job losses. As of 2016 with an official unemployment rate of 26.7%, close to 4 million people were out of work.

Note:

[Statistics South Africa](#) tracks and reports all data related to unemployment.



Who's In or Out of the Labor Force?

Should everyone without a job be counted as unemployed? Of course not. Children, for example, should not be counted as unemployed. Surely, the retired should not be counted as unemployed. Many full-time college students have only a part-time job, or no job at all, but it seems inappropriate to count them as suffering the pains of unemployment. Some people are not working because they are raising children, are ill, on vacation, or on parental leave.

The point is that the adult population (or population of working age) is not just divided into employed and unemployed. A third group exists: people who do not have a job (are not economically active), and for some reason—retirement, looking after children, taking a voluntary break before a new job

—are not interested in having a job just then, either. It also includes those who do want a job but have quit looking, often due to being discouraged by their inability to find suitable employment. Economists refer to this third group of those who are not working and not looking for work as **out of the labor force** or not in the labor force.

Statistics South Africa conducts quarterly labor force surveys (four times a year), which collect data on the number of people in the labor market. This information includes the number of people that are employed, unemployed and not economically active. The data is assembled by industry, province, sex, age and sector for both the formal and informal sectors (Africa Check: 2014). The surveys/interviews are conducted in 30,000 private households and worker hostels throughout South Africa. This sample is then weighted to accurately reflect the South African population as a whole.

Respondents are questioned about their employment activity in the week prior to the interview. The surveys duly note whether any form of work was undertaken in that period – even if the people interviewed had worked for as little as an hour. The surveys attempt to estimate the size of the working population (all persons between 15 and 64) and the labor force (all persons that are employed or unemployed). Other data typically collected by these surveys include information on people who are categorized as “discouraged job seekers” and those that are economically inactive (Africa Check: 2014).

Some Important Definitions

Discouraged job-seeker: A person is regarded as a discouraged job-seeker if he or she wanted to work but there are no jobs in the area; if he/she was unable to find work that required his/her skills; or if he/she has lost hope of finding any kind of work.

Not economically active: A person is considered to be economically inactive if he/she was able and available to work in the week prior to the survey but did not work; did not look for work; and did not try to start his/her own business. This includes people such as university students and adults caring for children at home.

Employed: A person (between 15 and 64) is considered to be employed if during the week before being surveyed he/she worked for a wage, salary or commission or ran any kind of business by themselves or with other people. He/she will be categorised as “employed” even if he/she only worked for an hour in that week.

Unemployed: Someone is considered to be unemployed if he/she is capable of working or starting a business but had not done so. Furthermore, he/she would need to have actively looked for work or tried to start a business at some point in the four weeks preceding the survey.

Out of the labor force: Out of paid work and not actively looking for a job

Labor force: the number of employed plus the unemployed

Calculating the Unemployment Rate

Figure 2 shows the three-way division of the working age population. As at June 2016, about 58.7% of the adult population was "in the labor force" (South Africa labor force participation rate: 2016); that is, people are either employed or without a job but looking for work. Those in the labor force can be divided into the employed and the unemployed. The **unemployment rate** is not the percentage of the total adult population without jobs, but rather the percentage of adults who are in the labor force. The labor force thus includes those of working age who are employed AND those who are unemployed. The unemployment rate is therefore calculated using the following formula:

Equation:

$$\text{Unemployment rate} = \frac{\text{Unemployed people}}{\text{Total labor force}} \times 100$$

Employed, Unemployed, and Out of the Labor Force
Distribution of Working Age Population (age 16
-64), June 2016

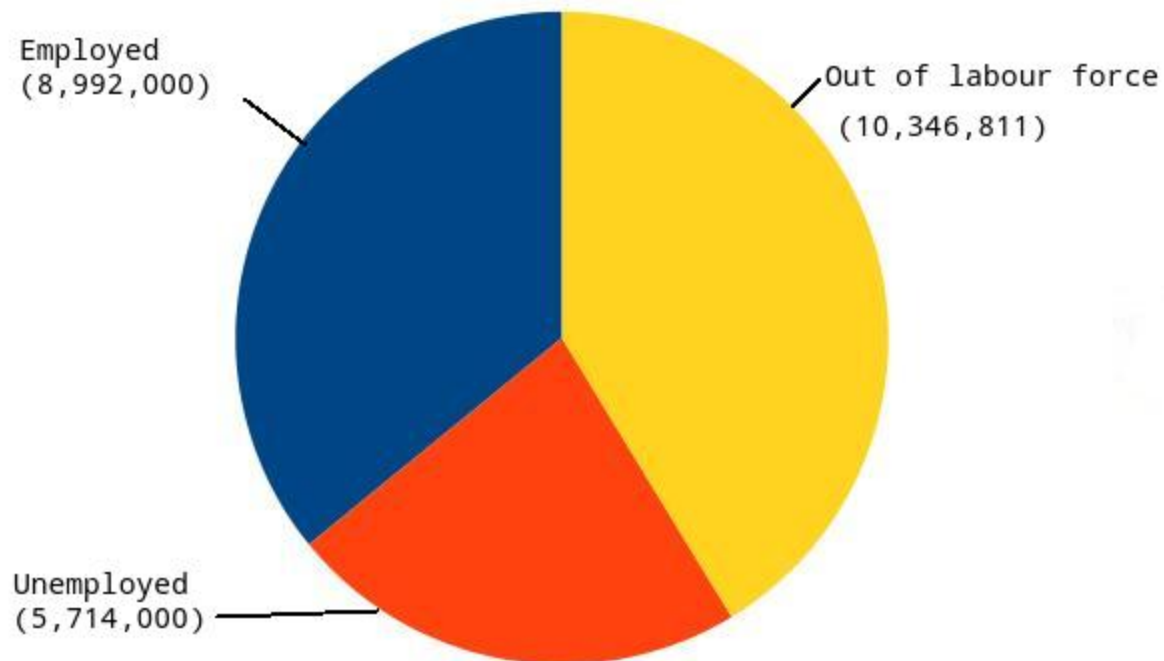


Figure 2. The total adult, working-age population as at June 2016 was 25,052,811. Out of this total population, 8,992,000 were classified as employed, and 5,714,000 million were classified as unemployed. The remaining 10,346,811 were classified as out of the labor force. As you will learn, however, this seemingly simple chart does not tell the whole story. (Source: South Africa labor force participation rate: 2016)

Total adult population over the age of 16	25,052,811
In the labor force	14,706,000 (58.7%)
Employed	8,992,000
Unemployed	5,714,000

Out of the labor force	10,346,811 (41.3%)
------------------------	--------------------

South African Employment and Unemployment, June 2016(Source: South Africa labor force participation rate: 2016)

In this example, the unemployment rate can be calculated as 5,714,000 unemployed people divided by 14,706,000 people in the labor force, which works out to a 38.9% rate of unemployment. The following Work It Out feature will walk you through the steps of this calculation.

Note:

Calculating Labor Force Percentages

So how do economists arrive at the percentages in and out of the labor force and the unemployment rate? We will use the values in Table 1 to illustrate the steps.

To determine the percentage in the labor force:

Step 1. Divide the number of people in the labor force (14,706,000) by the total working-age population (25,052,811).

Step 2. Multiply by 100 to obtain the percentage.

Equation:

$$\begin{aligned}\text{Percentage in the labor force} &= \frac{14,706,000}{25,052,811} \\ &= 0.587 \\ &= 58.7\%\end{aligned}$$

To determine the percentage out of the labor force:

Step 1. Divide the number of people out the labor force (10,346,811) by the total working-age population (25,052,811).

Step 2. Multiply by 100 to obtain the percentage.

Equation:

$$\begin{aligned}\text{Percentage out of the labor force} &= \frac{10,346,811}{25,052,811} \\ &= 0.413 \\ &= 41.3\%\end{aligned}$$

To determine the unemployment rate:

Step 1. Divide the number of unemployed people (5,714,000) by the total labor force (14,706,000).

Step 2. Multiply by 100 to obtain the rate.

Equation:

$$\begin{aligned}\text{Unemployment rate} &= \frac{5,714,000}{14,706,000} \\ &= 0.389 \\ &= 38.9\%\end{aligned}$$

Hidden Unemployment

Even with the “out of the labor force” category, there are still some people that are mislabeled in the categorization of employed, unemployed, or out of the labor force. There are some people who have only part time or temporary jobs and who are looking for full time and permanent employment that are counted as employed, though they are not employed in the way they would like or need to be. Additionally, there are individuals who are **underemployed**. This includes those that are trained or skilled for one type or level of work who are working in a lower paying job or one that does not utilize their skills. For example, an individual with a university of technology or traditional university degree in accounting who is working as a sales clerk would be considered underemployed. They are, however, also counted in the employed group. All of these individuals fall under the umbrella of the term “hidden unemployment.” **Discouraged workers**, those who have stopped looking for employment and, hence, are no longer counted in the unemployed also fall into this group.

Narrow versus broad definitions of unemployment

The question of who should be considered ‘unemployed’ is not without controversy. In 1998, Statistics South Africa officially adopted a “strict” definition of unemployment (Africa Check: 2014). This approach was in line with the International Labor Organization definition “used by more

than eighty percent of both developed and less developed countries, and South Africa's major trading partners". The strict definition of unemployment regards a person as unemployed only if they have "taken active steps to look for work or to start some form of self-employment in the four weeks prior to the interview". They are sometimes referred to as the "searching unemployed".

The expanded or broad definition of unemployment, on the other hand, includes discouraged job-seekers: those that want to work but are not actively searching for a job as they have lost hope, wanted to work but there are no jobs in the area or were unable to find work that required their skills. They have been referred to as the "non-searching unemployed" (Africa Check: 2014). Depending on which definition of unemployment is used, the unemployment rate will vary. The expanded measure of unemployment tends to be considerably higher than the narrow or strict measure of unemployment. Which measure do you think is a more reliable estimate of the actual rate of unemployment in South Africa?

Labor Force Participation Rate

Another important statistic is the **labor force participation rate**. This is the percentage of the population of working age who are either employed or who are unemployed and looking for a job. In fact we have already computed it as the percentage in the labor force. Those included in this calculation would be the 14,706,000 individuals in the labor force. The rate is calculated by taking the number of people in the labor force, that is, the number employed and the number unemployed, divided by the population of working age and multiplying by 100 to get the percentage. For the data from June 2016, the labor force participation rate is 58.7%.

Equation:

$$\text{Labor force participation rate} = \frac{\text{Labor force}}{\text{Population of working age}} \times 100$$

Criticisms of Measuring Unemployment

There are always complications in measuring the number of unemployed. For example, what about people who do not have jobs and would be available to work, but have gotten discouraged at the lack of available jobs in their area and stopped looking? Such people, and their families, may be suffering the pains of unemployment. But the survey counts them as out of the labor force because they are not actively looking for work. Other people may tell the Statistics South Africa survey workers that they are ready to work and looking for a job but, truly, they are not that eager to work and are not looking very hard at all. They are counted as unemployed, although they might more accurately be classified as out of the labor force. Still other people may have a job, perhaps doing something like yard work, child care, or cleaning houses, but are not reporting the income earned to the tax authorities. They may report being unemployed, when they actually are working.

Although the unemployment rate gets most of the public and media attention, economic researchers at Statistics South Africa publish a wide range of surveys and reports that try to measure these kinds of issues and to develop a more complete view of the labor market (such as the the Quarterly Labour Force Survey). We have already noted from the chapter on economic growth that macroeconomic measures such as GDP and GNP can, at best, only be estimates and are not perfectly accurate measures. The same goes for measures of unemployment. However, imperfect measures can still be quite informative, when interpreted knowledgeably and sensibly.

Key Concepts and Summary

Unemployment imposes high costs. Unemployed individuals suffer from loss of income and from stress. An economy with high unemployment suffers an opportunity cost of unused resources. The working age population can be divided into those in the labor force and those out of the labor force. In turn, those in the labor force are divided into employed and unemployed. A person without a job must be willing and able to work and actively looking for work to be counted as unemployed; otherwise, a person without a job is counted as being out of the labor force. The unemployment rate is defined as the number of unemployed persons divided by the number of persons in the labor force (not the working age population).

Self-Check Questions

Exercise:

Problem:

Suppose the working age population is 237.8 million and the labor force is 153.9 million (of whom 139.1 million are employed). How many people are “not in the labor force?” What are the proportions of employed, unemployed and not in the labor force in the population?

Hint: Proportions are percentages.

Solution:

The working age population is divided into those “in the labor force” and those “not in the labor force.” Thus, the number of adults not in the labor force is $237.8 - 153.9 = 83.9$ million. Since the labor force is divided into employed persons and unemployed persons, the number of unemployed persons is $153.9 - 139.1 = 14.8$ million. Thus, the adult population has the following proportions:

- $139.1/237.8 = 58.5\%$ employed persons
- $14.8/237.8 = 6.2\%$ unemployed persons
- $83.9/237.8 = 35.3\%$ persons out of the labor force

Exercise:

Problem: Using the above data, what is the unemployment rate?

Solution:

The unemployment rate is defined as the number of unemployed persons as a percentage of the labor force or $14.8/153.9 = 9.6\%$.

Review Questions

Exercise:

Problem:

What is the difference between being unemployed and being out of the labor force?

Exercise:

Problem:

How is the unemployment rate calculated? How is the labor force participation rate calculated?

Exercise:

Problem: Are all adults who do not hold jobs counted as unemployed?

Exercise:

Problem:

If you have completed university but are working only part time, are you considered employed or unemployed in South African labor statistics? If you are a full time student and working 12 hours a week as a temporary assistant in the student affairs section of the university are you considered employed or not in the labor force? If you are a senior citizen who is collecting a monthly pension and working as a sales assistant at Makro, are you considered employed or not in the labor force?

Exercise:

Problem:

What happens to the strict or narrow unemployment rate when unemployed workers are reclassified as discouraged workers?

Exercise:

Problem:

What happens to the labor force participation rate when employed individuals are reclassified as unemployed? What happens when they are reclassified as discouraged workers?

Exercise:**Problem:**

What are some of the problems with using the unemployment rate as an accurate measure of overall joblessness?

Exercise:**Problem:**

What criteria are used by Statistics South Africa to count someone as strictly unemployed? As broadly unemployed?

Exercise:**Problem:**

Assess whether the following would be counted as strictly “unemployed” according to Statistics South Africa.

- A. A husband willingly stays home with children while his wife works.
- B. A manufacturing worker whose factory just closed down.
- C. A full time university student doing an unpaid internship/work experience.
- D. A retired person.
- E. Someone who has been out of work for two years but keeps looking for a job.
- F. Someone who has been out of work for two months but isn't looking for a job.
- G. Someone who hates her present job and is actively looking for another one.
- H. Someone who decides to take a part time job because she could not find a full time position.

Critical Thinking Questions

Exercise:

Problem:

Using the definition of the unemployment rate, is an increase in the unemployment rate necessarily a bad thing for a nation?

Exercise:

Problem:

Is a decrease in the unemployment rate necessarily a good thing for a nation? Explain.

Exercise:

Problem:

If many workers become discouraged from looking for jobs, explain how the number of jobs could decline but the unemployment rate could fall at the same time.

Exercise:

Problem:

Would you expect hidden unemployment to be higher, lower, or about the same when the unemployment rate is high, say 15%, versus low, say 5%? Explain.

Problems

Exercise:

Problem:

A country with a working age population of eight million adults has five million employed, 500,000 unemployed, and the rest of the adult population is out of the labor force. What's the unemployment rate? What share of population is in the labor force? Sketch a pie chart that divides the adult population into these three groups.

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Glossary

discouraged workers

those who have stopped looking for employment due to the lack of suitable positions available

labor force participation rate

this is the percentage of adults in an economy who are either employed or who are unemployed and looking for a job

out of the labor force

those who are not working and not looking for work—whether they want employment or not; also termed “not in the labor force”

underemployed

individuals who are employed in a job that is below their skills

unemployment rate

the percentage of adults who are in the labor force and thus seeking jobs, but who do not have jobs

Patterns of Unemployment

By the end of this section, you will be able to:

- Explain historical patterns of unemployment in the U.S.
- Identify trends of unemployment based on demographics
- Evaluate global unemployment rates

Let's look at how unemployment rates have changed over time and how various groups of people are affected by unemployment differently.

The Historical South African Unemployment Rate

Figure 1 shows the historical and projected pattern of South African unemployment since 1994.

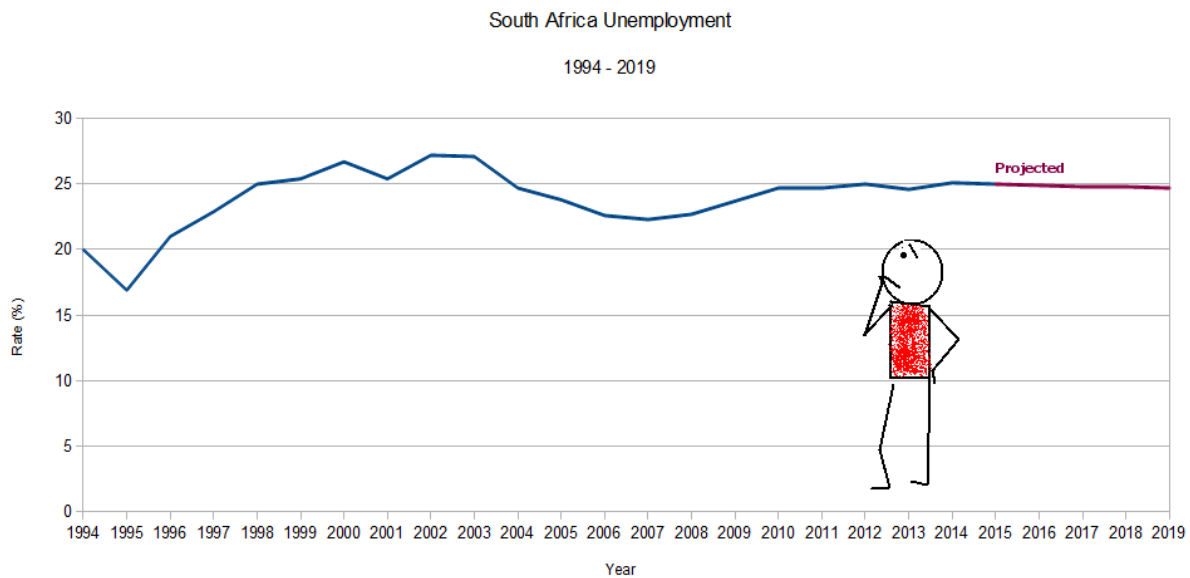


Figure 1. Historical and projected unemployment in South Africa, 1994-2019 (Source: South Africa unemployment 1994-2015: 2015)

As we look at this data, several patterns stand out:

1. Unemployment rates do fluctuate over time.
2. Unemployment rates in South Africa have historically tended to be relatively high. The country's highest levels of unemployment were experienced in 2002 and 2003, when the rate rose to over 27%. Relative to other countries, however, the highest placement in the ranking was in 2000, when the rate of 26.7% was the 5th highest in the world (South Africa unemployment 1994-2015: 2015).
3. The unemployment rate never falls all the way to zero. Even in countries that have good employment records, it never seems to get below 3%—and it stays that low only for very short periods. (Reasons why this is the case are discussed later in this chapter.)
4. The timing of rises and falls in unemployment matches fairly well with the timing of upswings and downswings in the overall economy. During periods of recession and depression, unemployment is high. During periods of economic growth, unemployment tends to be lower.

Unemployment in pictures

Unemployment is not distributed evenly across the South African population. The following figures show unemployment rates/patterns broken down in various ways: by gender, age, race/ethnicity, qualification and region/province.

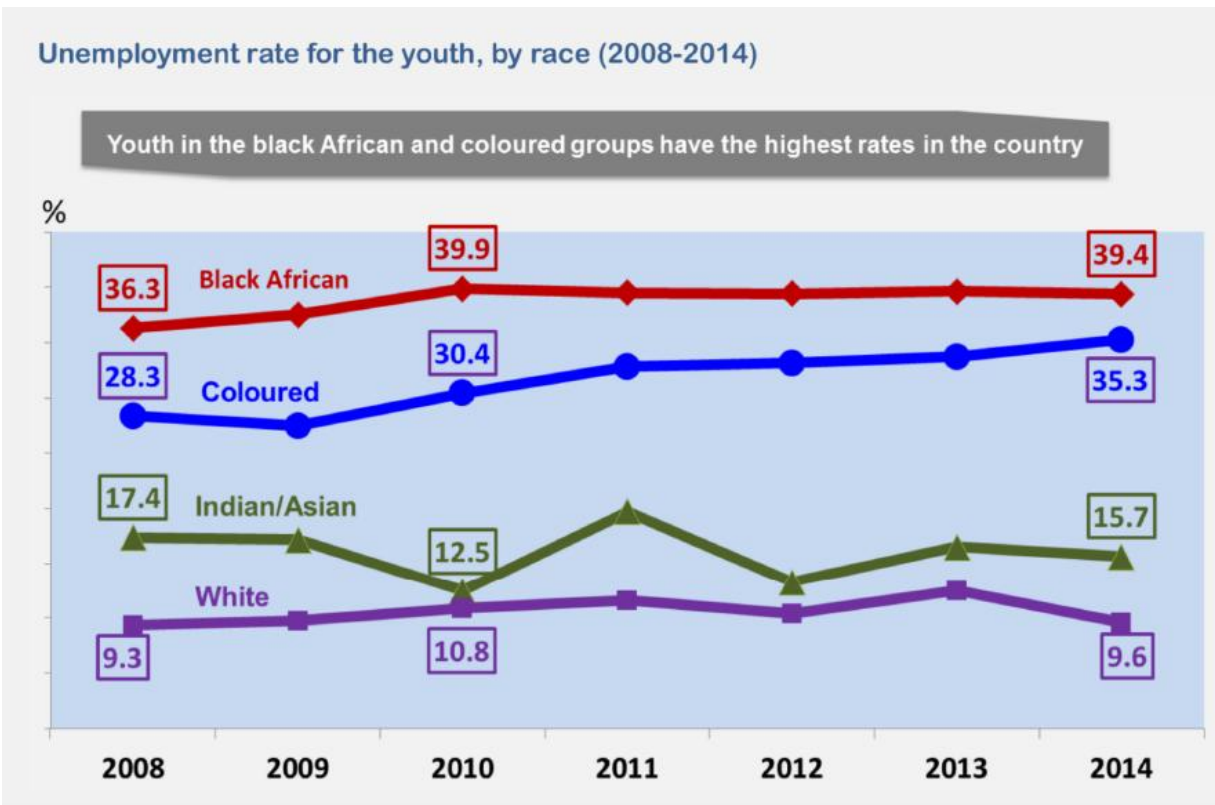


Figure 2. Youth unemployment patterns by race, 2008-2014 (Source: Statistics South Africa: 2015)

The unemployment rate for Black Africans and Coloureds is substantially higher than the rates for Indians/Asians and Whites. This fact surely reflects, to some extent, a pattern of discrimination that historically constrained labor market opportunities for sections of South African society under South Africa's Apartheid dispensation. The fact is that, prior to 1994 (pre-Apartheid South Africa), certain jobs were formally reserved primarily for Whites. While this is no longer the case, many Black Africans as well as Coloureds and Indians were set back in their careers and opportunities for advancement and some of this legacy persists today.

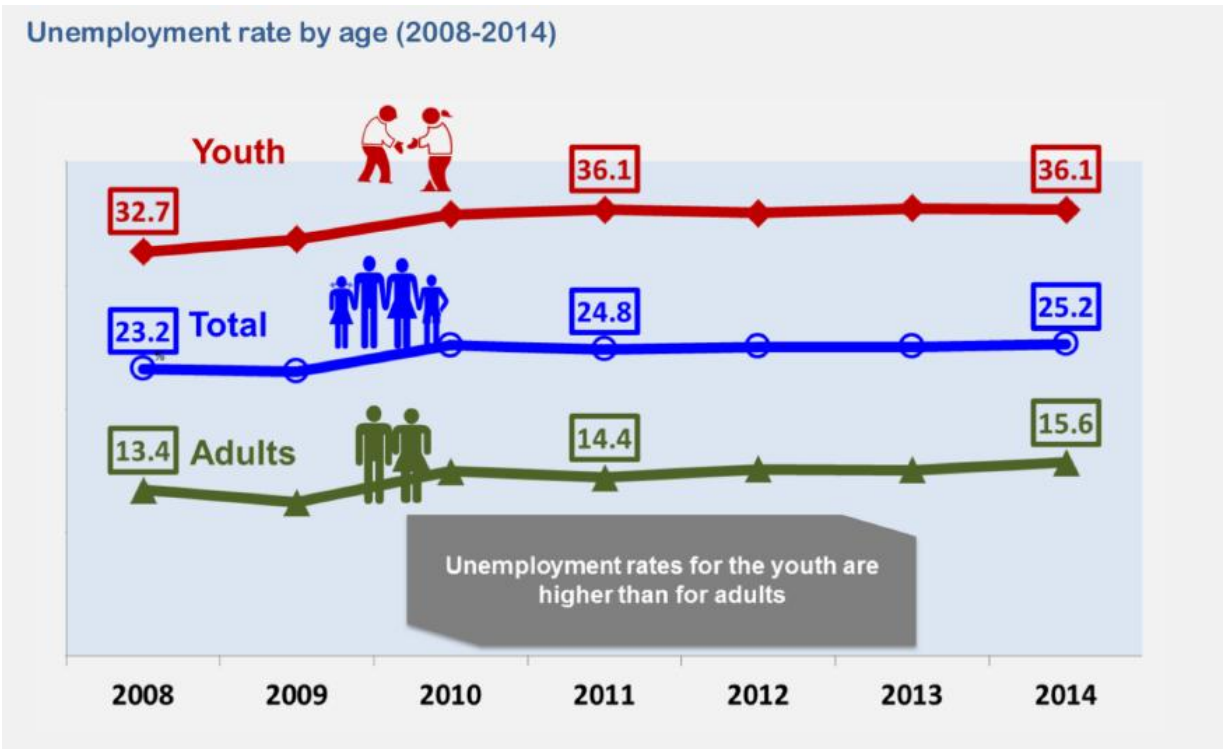


Figure 3. Unemployment patterns by age, 2008-2014 (Source: Statistics South Africa: 2015)

Younger workers tend to have higher unemployment, while middle-aged workers tend to have lower unemployment, probably because the middle-aged workers feel the responsibility of needing to have a job more heavily. Younger workers move in and out of jobs (and in and out of the labor force) more easily. Elderly workers have relatively low rates of unemployment, because those who do not have jobs often exit the labor force by retiring, and thus are not counted in the unemployment statistics.

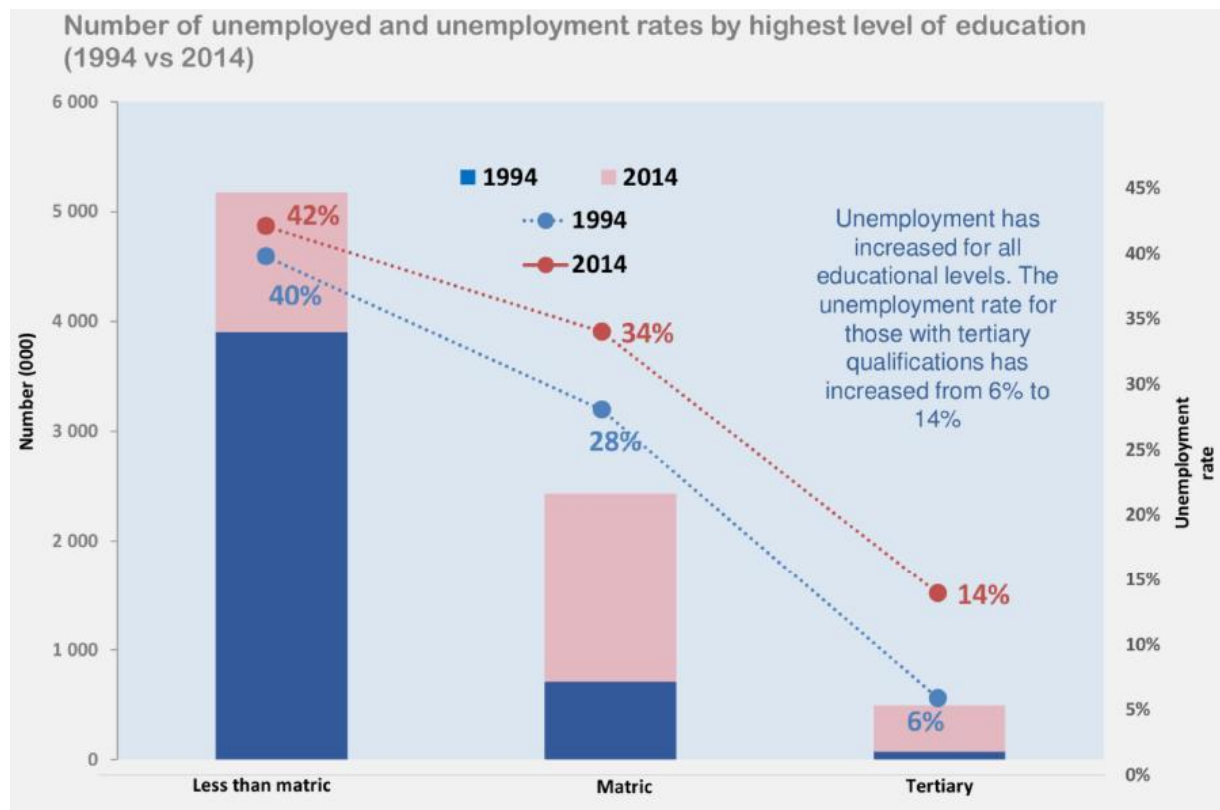


Figure 4. Unemployment patterns by education level, 2008-2014 (Source: Statistics South Africa: 2015)

Those with less education typically suffer higher unemployment. This pattern may arise because additional education offers better connections to the labor market and higher demand, or it may occur because the labor market opportunities for low-skilled workers are less attractive than the opportunities for the more highly-skilled. Because of lower pay, low-skilled workers may be less motivated to find jobs.

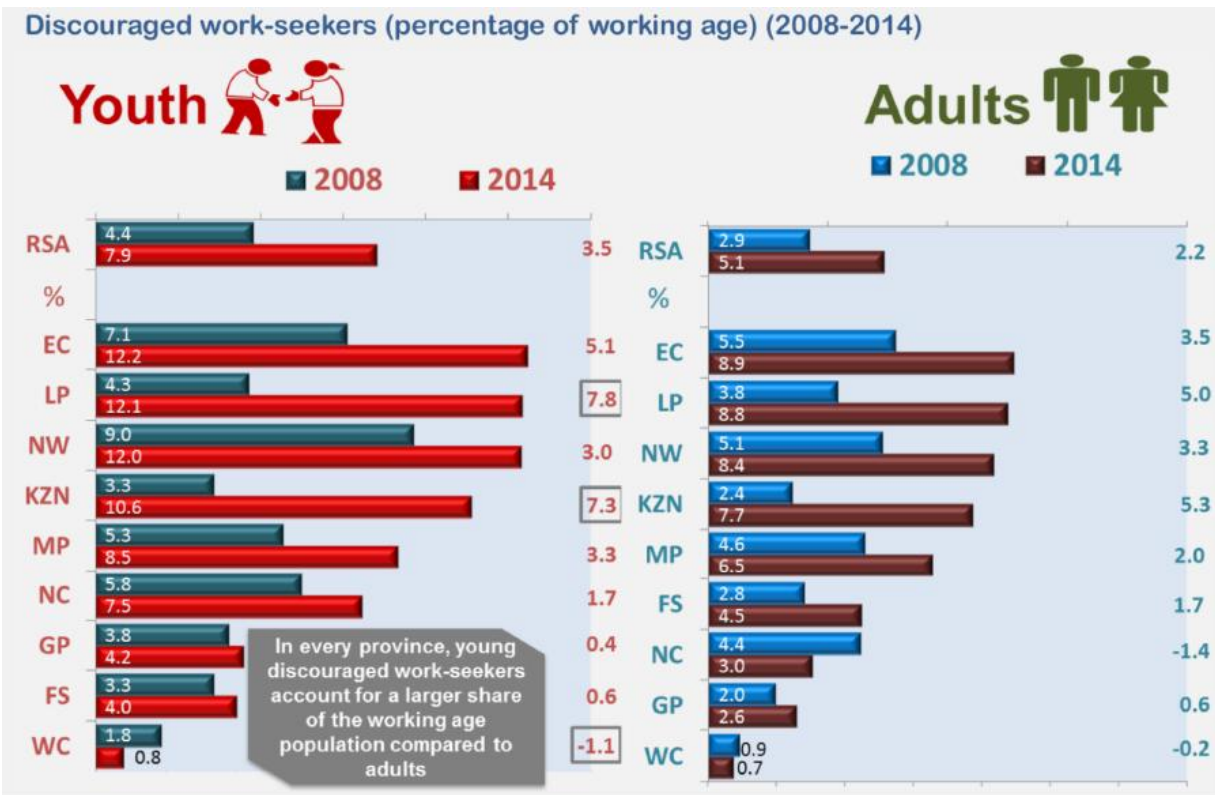


Figure 5. Distribution of discouraged workers by age and province, 2008-2014 (Source: Statistics South Africa: 2015)

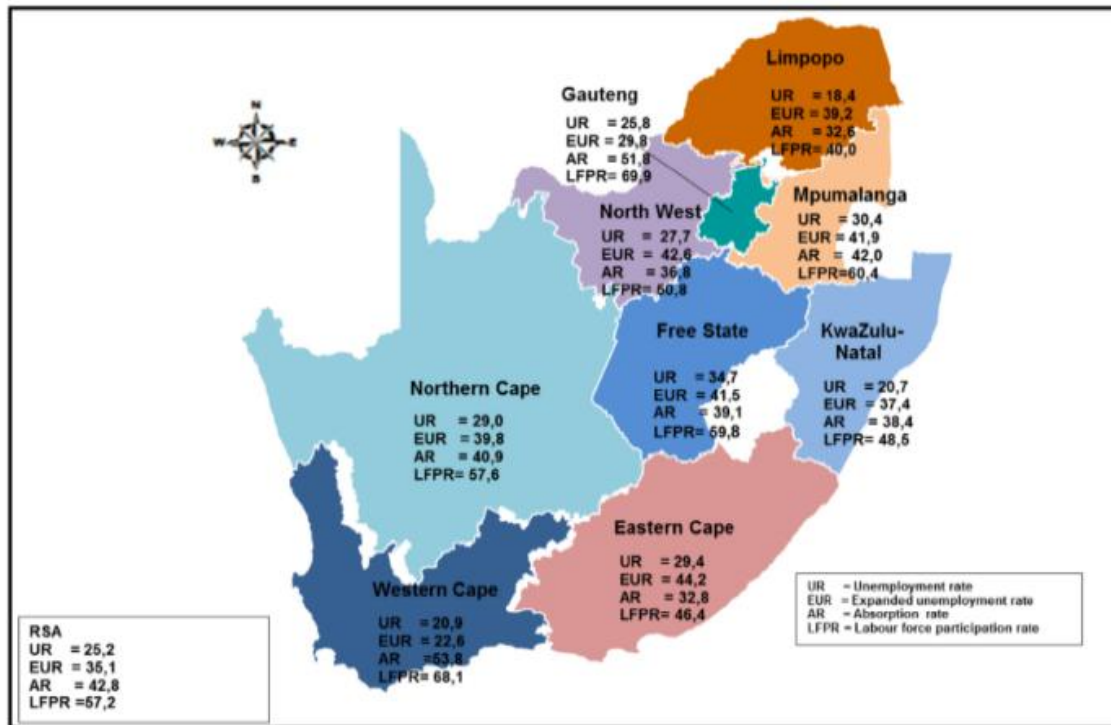


Figure 6. Unemployment patterns by province in the first Quarter of 2014 (Source: Statistics South Africa: 2015)

The different unemployment rates by province may reflect different economic structures and opportunities in these regions. Thus some provinces may have more urban areas and thus a greater incidence of manufacturing and services and consequently more employment opportunities. Other provinces, by contrast, might have predominantly agricultural and mining economies with correspondingly lower employment opportunities.

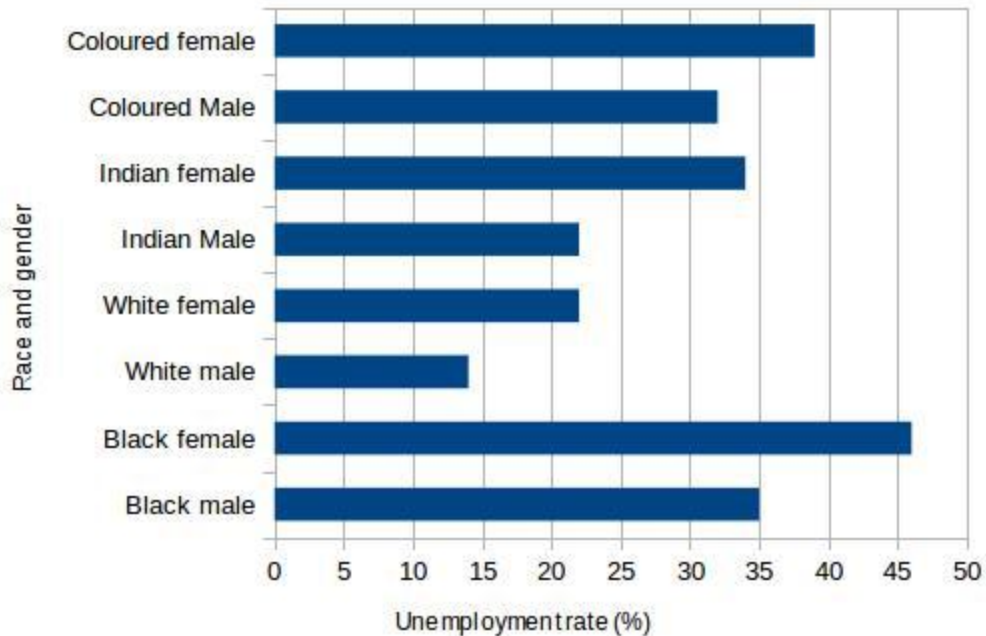


Figure 7. An unemployment snapshot by gender and race, 2014 (Source: Van Wyk: 2014)

The unemployment rate for women has generally tended to be higher than the unemployment rate for men, perhaps reflecting the historical pattern in a patriarchal society that women were seen as “secondary” earners. Gender discrimination in terms of employment is ongoing and is reflected in higher unemployment rates for women even in the modern era.

International Unemployment Comparisons

From an international perspective, South African unemployment has been consistently far higher than average. Table 1 compares unemployment rates for 1991, 1996, 2001, 2006 (just before the recession), and 2012 (somewhat after the recession) from several other high-income countries.

Country	1991	1996	2001	2006	2012
United States	6.8%	5.4%	4.8%	4.4%	8.1%
Canada	9.8%	8.8%	6.4%	6.2%	6.3%
Japan	2.1%	3.4%	5.1%	4.5%	3.9%
France	9.5%	12.5%	8.7%	10.1%	10.0%
Germany	5.6%	9.0%	8.9%	9.8%	5.5%
Italy	6.9%	11.7%	9.6%	7.8%	10.8%
Sweden	3.1%	9.9%	5.0%	5.2%	7.9%
United Kingdom	8.8%	8.1%	5.1%	5.5%	8.0%
South Africa	24.5%	21%	25.4%	22.6%	25%

International Comparisons of Unemployment Rates(Source: World Bank: 2016)

However, cross-country comparisons of unemployment rates need to be treated with care, because each country has slightly different survey tools for measuring unemployment and also different labor markets. For example, Japan's unemployment rates appear quite low, but Japan's economy has been stuck in slow growth and recession since the late 1980s, and Japan's unemployment rate probably paints too rosy a picture of its labor market. In Japan, workers who lose their jobs are often quick to exit the labor force and not look for a new job, in which case they are not counted as unemployed. In addition, Japanese firms are often quite reluctant to fire workers, and so firms have substantial numbers of workers who are on reduced hours or officially employed, but doing very little. This

Japanese pattern is perhaps best viewed as an unusual method for society to provide support for the unemployed, rather than a sign of a healthy economy.

Note:

We hear about the Chinese economy in the news all the time. The value of the Chinese yuan in comparison to the South African Rand and other currencies is likely to be reported in the business news. So why is the Chinese economy not included in this discussion of international unemployment? The lack of reliable statistics is probably the reason. This [article](#) explains why.



Comparing unemployment rates in South Africa with that of other countries in Africa, Latin America, Eastern Europe, and Asia is very difficult. One reason is that the statistical agencies in many poorer countries lack the resources and technical capabilities of the higher- (America and Europe) and middle income countries (such as South Africa). Thus the statistics they produce are simply not reliable. A further problem with international comparisons is that in many low-income countries, most workers are not involved in the labor market through an employer who pays them regularly. Instead, workers in these countries are engaged in short-term work, subsistence activities, and barter. So official unemployment would not be high but there would probably be much "hidden" unemployment or under-employment. Moreover, the effect of unemployment is very different in high-income and low-income countries. Unemployed workers in the developed (high-income) economies sometimes have access to various

government programs like unemployment insurance, welfare, and food stamps; such programs may barely exist in poorer countries. Although unemployment is a serious problem in many low-income countries, it manifests itself in a different way than in high-income countries.

Key Concepts and Summary

The South African unemployment rate rises during periods of recession and depression, but falls back again when the economy is strong. In spite of this, South Africa has historically had high rates of unemployment. Despite some growth in the size of the South African economy, the unemployment rate shows no significant declining trend. On the contrary, South African unemployment seems to be on an upward trajectory.

Unemployment rates differ by group: race, age, gender, educational level and region.

Self-Check Questions

Exercise:

Problem:

Over the long term, has the South African unemployment rate generally trended up, trended down, or remained at basically the same level?

Solution:

Over the long term, the South African unemployment rate has remained basically the same level (the low 22-25 percent).

Exercise:

Problem:

Which unemployment rates are commonly higher in the South African economy:

- a. Females or Males?
 - b. The young or the middle-aged?
 - c. University graduates or high school graduates?
-

Solution:

- a. Females
- b. The young
- c. High school graduates

Review Questions

Exercise:

Problem:

Are South African unemployment rates typically higher, lower, or about the same as unemployment rates in other high-income countries?

Exercise:

Problem:

Are South African unemployment rates distributed evenly across the population?

Critical Thinking Questions

Exercise:

Problem:

Are the higher unemployment rates for Black Africans and Coloureds necessarily an indication of discrimination? What could be some other reasons for their higher unemployment rates?

Exercise:

Problem:

While unemployment is directly related to the level of economic activity, in the real world there is a delay before employment is affected. In other words, firms do not immediately lay off workers in response to a sales decline. They wait a while before responding. Similarly, firms do not immediately hire workers when sales pick up. What do you think accounts for the lag in response time?

Exercise:**Problem:**

Why do you think that unemployment rates are lower for individuals with more education?

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What Causes Changes in Unemployment over the Short Run

By the end of this section, you will be able to:

- Analyze cyclical unemployment
- Explain the relationship between sticky wages and employment using various economic arguments
- Apply supply and demand models to unemployment and wages

We have seen that unemployment varies across times and places. What causes changes in unemployment? There are different answers in the short run and in the long run. Let's look at the short run first.

From the standpoint of the supply-and-demand model of competitive and flexible labor markets, unemployment represents something of a puzzle. In a supply-and-demand model of a labor market, as illustrated in Figure 1, the labor market should move toward an equilibrium wage and quantity. At the equilibrium wage (W_e), the equilibrium quantity (Q_e) of labor supplied by workers should be equal to the quantity of labor demanded by employers.

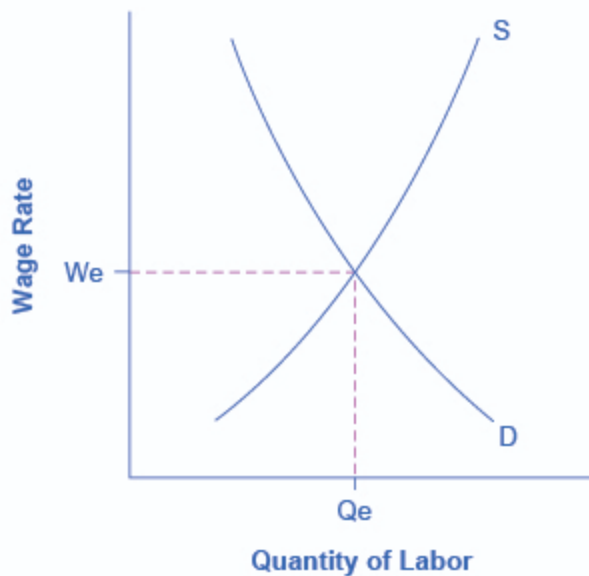


Figure 1. In a labor market with flexible wages, the equilibrium will occur at wage W_e and quantity Q_e , where the number of people looking for jobs (shown by S) equals the number of jobs available (shown by D).

One possibility for unemployment is that people who are unemployed are those who are not willing to work at the current equilibrium wage, say R30 an hour, but would be willing to work at a higher wage, like R60 per hour. Statistics South Africa's quarterly employment surveys would count these people as unemployed, because they say they are ready and looking for work (at R60 per hour). But from an economist's point of view, these people are choosing to be unemployed.

However, it is not always possible to appreciate all the possible causes of unemployment by using only a simple market diagram as we have done in Figure 1. What about poor business conditions, unskilled labourers, increased business competition such as imported products and technology and automation replacing labour? We will look at some of these aspects in the following sections.

Cyclical Unemployment

Let's make the reasonable assumption that in the short run, from a few months to a few years, the quantity of hours that the average person is willing to work for a given wage does not change much, so the labor supply curve does not shift much. In addition, make the standard *ceteris paribus* (all other relevant things remain unaltered) assumption that there is no substantial short-term change in the age structure of the labor force, institutions and laws affecting the labor market, or other possibly relevant factors.

One primary determinant of the demand for labor from firms is how they perceive the state of the macro economy. If firms believe that business is expanding, then at any given wage they will desire to hire a greater quantity

of labor and the labor demand curve shifts to the right. In this sense the demand for labor is a **derived demand**: the demand for labor derives or comes from the demand for firms' goods and services. If firms perceive that the economy is slowing down or entering a recession, then they will wish to hire a lower quantity of labor at any given wage, and the labor demand curve will shift to the left. The variation in unemployment caused by the economy moving from expansion to recession or from recession to expansion (i.e. the business cycle) is known as **cyclical unemployment**.

Intervention in the labor market as a possible cause of unemployment

Labor markets, like markets for goods and services, are not characterised by perfect competition. In other words, there is not always a perfect intersection of demand for labour and supply of labour resulting in a perfect equilibrium wage (that keeps everyone happy) and a perfect level of employment where everyone who wants a job has one. The reality is that people always tend to want or need higher wages and there are also generally more job seekers than there are jobs. Add to this difficult mix the fact that the power relations between employer and employees are not equally balanced with employers tending to call the shots. Employers decide what wage they want to offer, how many people they want to employ and what conditions of service they are prepared to offer.

Efforts to regulate the labor market to achieve improved wages may result in unemployment. In this section we look at trade union and government interventions in the labor market and what effect these may have on employment levels.

Trade unions

Trade unions have their origin in the collective action of workers to rebalance the unequal power relations between workers and employers. Thus by uniting and pressing their demands for better wages and improved working conditions, workers became a force to be reckoned with. Employers were now forced to negotiate with worker unions (**collective bargaining**), failing which (and following mediation/arbitration) unions could embark on various actions to withhold their labor (through strike

action for example). Unions may also choose to cooperate with employers which action may also affect wage rates and employment levels. In either case (threatened/actual strike action or cooperation with employers), the supply and/or demand for labor is being affected by the actions of the trade union.

Industrial unions attempt to include all workers in a particular industry, both skilled and unskilled, into a single bargaining unit. For this reason they have also been termed **umbrella unions**. Membership in these types of unions is not restricted only to workers with specific qualifications or skills. Notable examples of these types of unions in South Africa would include the National Union of Mineworkers (NUM), the National Union of Metal Workers of South Africa (NUMSA) and the Association of Mineworkers and Construction Union (AMCU), among others.

The objective of industrial unions is to control the labor supply in an industry although they seldom achieve this goal completely given their often diverse and large membership. Instead these unions tend to use their bargaining power directly to increase wage rates. In Figure 2 below, strike action or just the **threat** of strike action, has the effect of raising the wage rate from W_0 to W_1 . Notice also that the employment level will fall from N_0 to N_1 . The actual impact on employment levels of this type of industrial action will depend on the elasticity of demand for labor.

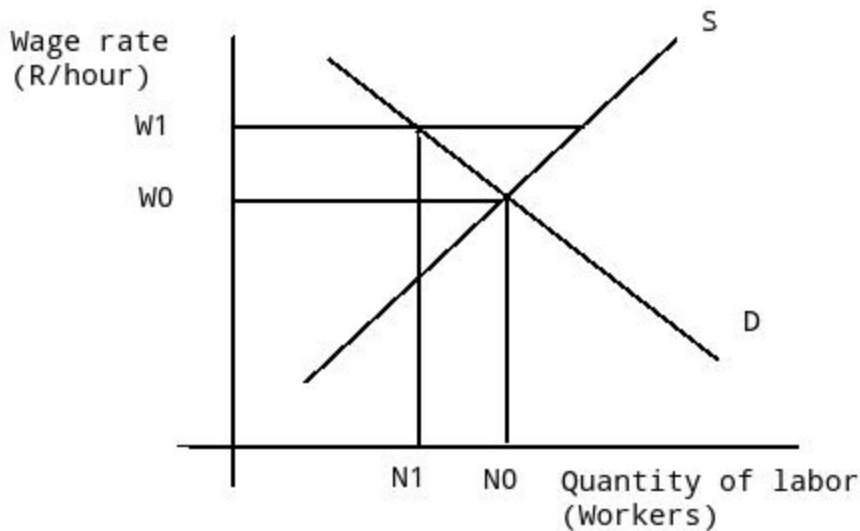


Figure 2

Craft unions invite membership from workers who have common training, skills or qualifications. Examples would include the South African Democratic Teachers' Union (SADTU), the South African Football Players' Union (SAPFU) and various professional bodies such as those in the legal, accounting and medical fields among others. These types of unions and associations/bodies are able to effectively control the supply of labor in various ways. These might include varying training and qualification requirements for entrance to the relevant craft or profession. Membership rules pertaining to craft unions or professional associations could be made more, or less, strict to regulate the supply of these skilled workers. Thus, for example, more stringent qualification requirements or longer stipulated training periods would result in fewer graduates and so a decreased supply of labor as shown in Figure 3. The result would be an increase in wage from W_0 to W_1 and also a decrease in employment from N_0 to N_1 .

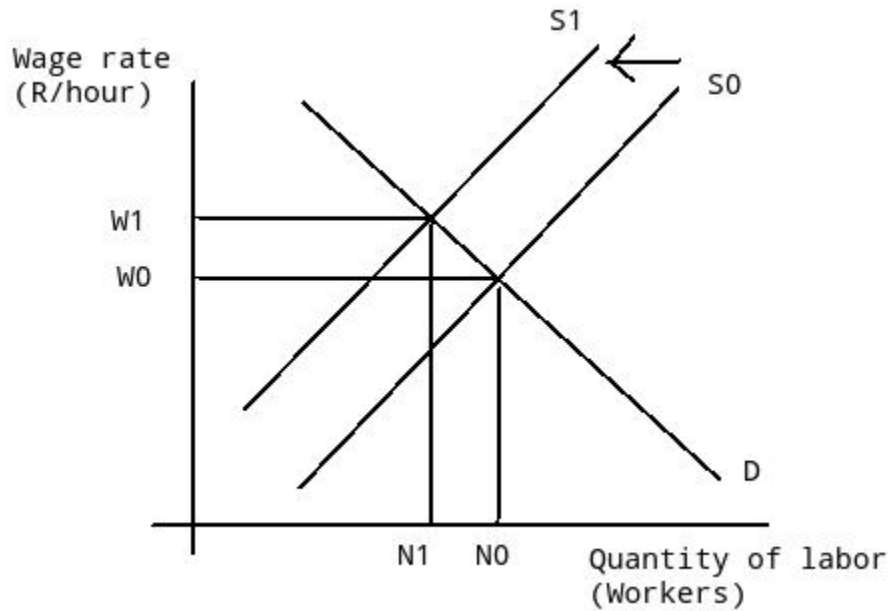


Figure 3

Industrial action or even just the threat of industrial action is disruptive, causes distrust and tension and may have lasting negative consequences for employer/employee relations. Unions may opt instead to embark on a more constructive strategy of encouraging employers to hire more labor, that is, increase the demand for labor. This might be achieved in several ways. Firstly, unions could enter into productivity agreements with employers. Thus workers agree to improve their productivity in exchange for higher wages and/or a share of the business profits. If workers prove themselves to be more productive, employers might be tempted to hire more of them: demand for labor increases as shown in Figure 4. Wage increases from W_0 to W_1 . Note, however, that employment levels increase as well from N_0 to N_1 .

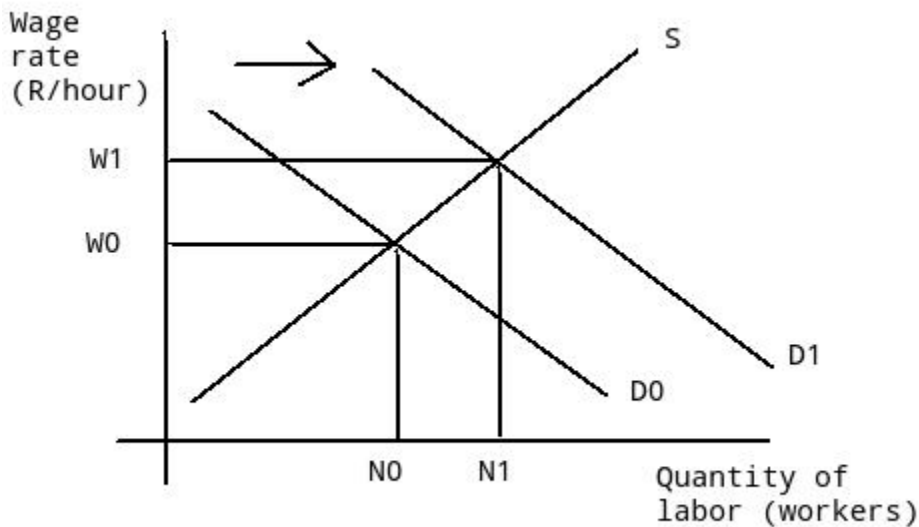


Figure 4.

Alternatively unions may support employers's associations in appealing to government to protect domestic industries from foreign competition by imposing or raising import tariffs and quotas. These measures would boost local production and, because demand for labor is derived from local production, demand for labour would increase. The effect would be an increase in wage from W_0 to W_1 and an increase in employment from N_0 to N_1 as in Figure 4.

Minimum wages

While trade unions interfere with the labor market and try to influence wage rates and employment levels by manipulating the demand and supply of labor, government may also seek to regulate labor market outcomes. It is generally accepted that workers are not in as strong a position as employers in terms of negotiating employment contracts. Trade unions tend to strengthen the bargaining position of employees. However, what about employees that do not belong to unions? They would have no protection unless government assisted them. This is the purpose and intention of minimum wages: to prevent workers from being exploited regardless of whether or not they are unionized.

Minimum wages are statutory (legislated) minimum payments for labor effort. By law, thus, employers may not pay their workers less than the stipulated minimum wage. Supporters of minimum wage legislation argue that it secures a certain minimum standard of living for workers. Higher wages are also reckoned to improve worker health and motivation to work which is likely to result in greater productivity. Proponents of minimum wages also argue that workers who earn better wages will be in a position to spend more money which, in turn will boost sales and production which may result in higher economic growth.

In South Africa, workers in the following sectors enjoy minimum wage protection: civil engineering, contract cleaning, domestic workers, farm workers, forestry, hospitality, leadership allowance, private security, wholesale and retail and the taxi industry (Minimum wages in South Africa: 2016). Check out the [Mywage](#) website for the minimum wage rates that apply to the different sectors in South Africa.

Opponents of minimum wages argue that they tend to raise the cost of production unless productivity also increases. These costs tend to get passed on to consumers in the form of higher prices (inflation). Furthermore, because a minimum wage must be set above the current market (equilibrium) wage rate to be effective, it may result in a decrease in the quantity demanded of labor as shown in Figure 5.

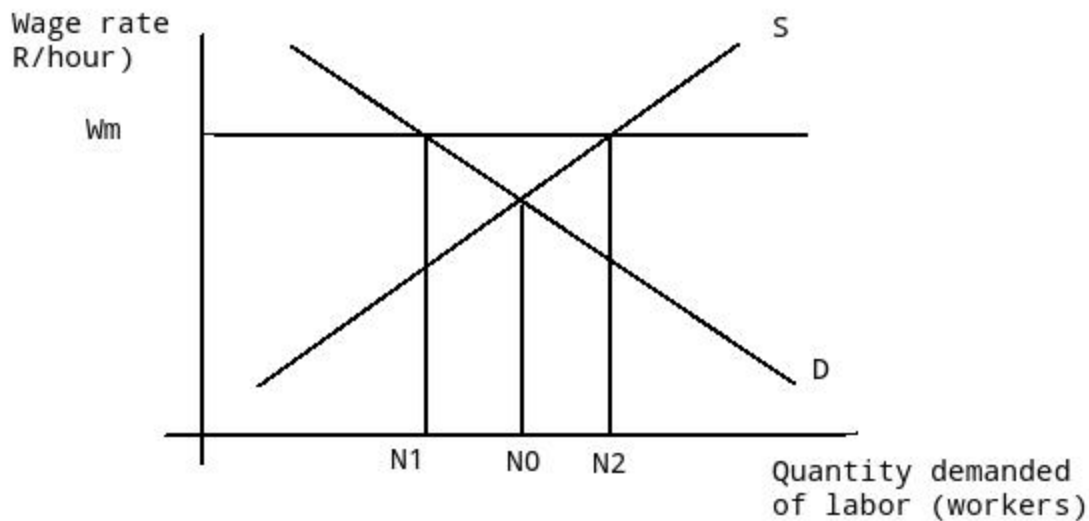


Figure 5

With the imposition of the minimum wage, employment falls from N_0 to N_1 . In addition the improved wage now attracts more people who would be willing and able to work at the new minimum wage rate, so quantity supplied of workers increases from N_0 to N_2 . However, these potential workers would be surplus to the reduced requirements of employers. So $N_0 - N_1$ employees would have lost their jobs and to this must be added $N_0 - N_2$ new job-seekers who must be counted as unemployed. The full amount of the unemployment caused by the minimum wage is thus $N_1 - N_2$.

Probably a few people are unemployed because of unrealistic expectations about wages, but they do not represent the majority of the unemployed. Instead, unemployed people often have friends or acquaintances of similar skill levels who are employed, and the unemployed would be willing to work at the jobs and wages similar to what is being received by those people. But the employers of their friends and acquaintances do not seem to be hiring. In other words, these people are involuntarily unemployed. What causes involuntary unemployment?

Why Wages Might Be "Sticky Downward"

If a labor market model with flexible wages does not describe unemployment very well—because it predicts that anyone willing to work at the going wage can always find a job—then it may be useful to consider different economic models in which wages are not flexible or adjust only very slowly. In particular, models where even though wage increases may occur with relative ease, wage decreases are few and far between.

When unemployment rises the wages of those workers that remain employed tend to stay the same or grow at a slower rate than before rather than falling with the decrease in demand for labor. Wages are then said to be "sticky down" meaning that they move up easily but move down only with difficulty. For additional explanation see Sticky Wage Theory in Investopedia (2016).

One set of reasons why wages may be “sticky downward,” as economists put it, involves economic laws and institutions. For low-skilled workers being paid the minimum wage, it is illegal to reduce their wages. For union workers operating under a multiyear contract with a company, wage cuts might violate the contract and create a labor dispute or a strike. However, minimum wages and union contracts are not a sufficient reason why wages would be "sticky downward" for the South African economy as a whole. After all, minimum wages do not apply to all sectors of the economy. The main intended beneficiaries of minimum wages are unskilled and semi-skilled workers. In addition not all sectors or industries are unionized.

Economists looking for reasons why wages might be "sticky downwards" have focused on factors that may characterize most labor relationships in the economy, not just a few. A number of different theories have been proposed, but they share a common tone.

One argument is that even employees who are not union members often work under an **implicit contract**, which is that the employer will try to keep wages from falling when the economy is weak or the business is having trouble, and the employee will not expect huge salary increases when the economy or the business is strong. This wage-setting behavior acts like a form of insurance: the employee has some protection against wage declines in bad times, but pays for that protection with lower wages in good times. Clearly, this sort of implicit contract means that firms will be

hesitant to cut wages, lest workers feel betrayed and work less hard or even leave the firm.

Efficiency wage theory argues that the productivity of workers depends on their pay, and so employers will often find it worthwhile to pay their employees somewhat more than market conditions might dictate. One reason is that employees who are paid better than others will be more productive because they recognize that if they were to lose their current jobs, they would suffer a decline in salary. As a result, they are motivated to work harder and to stay with the current employer. In addition, employers know that it is costly and time-consuming to hire and train new employees, so they would prefer to pay workers a little extra now rather than to lose them and have to hire and train new workers. Thus, by avoiding wage cuts, the employer minimizes costs of training and hiring new workers, and reaps the benefits of well-motivated employees.

The **adverse selection of wage cuts argument** points out that if an employer reacts to poor business conditions by reducing wages for all workers, then the best workers, those with the best employment alternatives at other firms, are the most likely to leave. The least attractive workers, with fewer employment alternatives, are more likely to stay. Consequently, firms are more likely to choose which workers should depart, through layoffs and firings, rather than trimming wages across the board. Sometimes companies that are going through tough times can persuade workers to take a pay cut for the short term, and still retain most of the firm's workers. But these stories are notable because they are so uncommon. It is far more typical for companies to lay off some workers, rather than to cut wages for everyone.

The **insider-outsider model** of the labor force, in simple terms, argues that those already working for firms are "insiders," while new employees, at least for a time, are "outsiders." A firm depends on its insiders to grease the wheels of the organization, to be familiar with routine procedures, to train new employees, and so on. However, cutting wages will alienate the insiders and damage the firm's productivity and prospects.

Finally, the **relative wage coordination argument** points out that even if most workers were hypothetically willing to see a decline in their own

wages in bad economic times as long as everyone else also experiences such a decline, there is no obvious way for a decentralized economy to implement such a plan. Instead, workers confronted with the possibility of a wage cut will worry that other workers will not have such a wage cut, and so a wage cut means being worse off both in absolute terms and relative to others. As a result, workers fight hard against wage cuts.

These theories of why wages tend not to move downward differ in their logic and their implications, and figuring out the strengths and weaknesses of each theory is an ongoing subject of research and controversy among economists. All tend to imply that wages will decline only very slowly, if at all, even when the economy or a business is having tough times. When wages are inflexible and unlikely to fall, then either short-run or long-run unemployment can result. This can be seen in Figure 6.

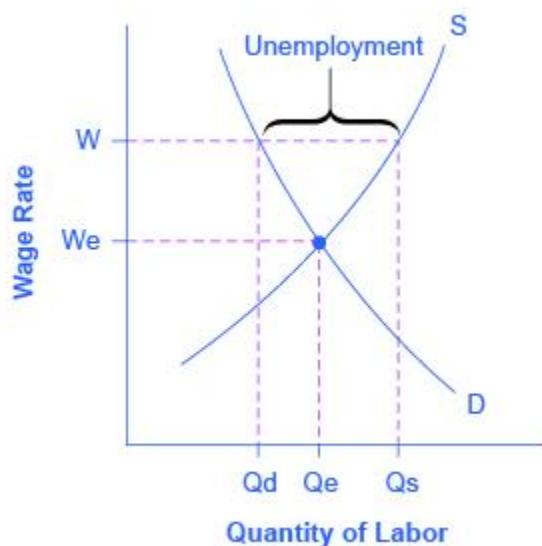
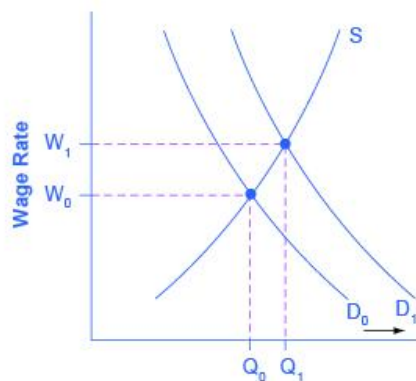


Figure 6. Because the wage rate is stuck at W , above the equilibrium, the number of job seekers (Q_s) is greater than the number of job openings

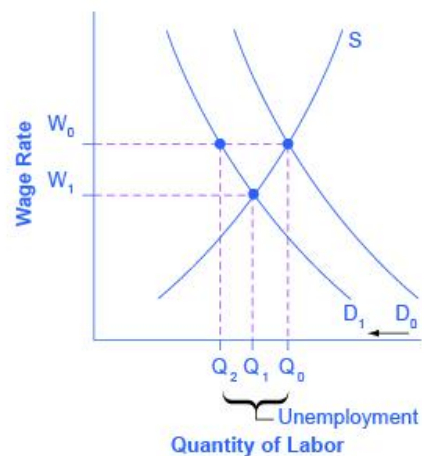
(Qd). The result is unemployment, shown by the bracket in the figure.

The interaction between shifts in labor demand and wages that are "sticky downward" are shown in Figure 6 (a) illustrates the situation in which the demand for labor shifts to the right from D_0 to D_1 . In this case, the equilibrium wage rises from W_0 to W_1 and the equilibrium quantity of labor hired increases from Q_0 to Q_1 . It does not hurt employee morale at all for wages to rise.

Figure 6 (b) shows the situation in which the demand for labor shifts to the left, from D_0 to D_1 , as it would tend to do in a recession. Because wages are "sticky downward", they do not adjust toward what would have been the new equilibrium wage (Q_1), at least not in the short run. Instead, after the shift in the labor demand curve, the same quantity of workers is willing to work at that wage as before; however, the quantity of workers demanded at that wage has declined from the original equilibrium (Q_0) to Q_2 . The gap between the original equilibrium quantity (Q_0) and the new quantity demanded of labor (Q_2) represents workers who would be willing to work at the going wage but cannot find jobs. The gap represents the economic meaning of unemployment.



(a) Rising demand for labor, wages rise



(b) Falling demand for labor, sticky wages, and unemployment

Figure 7. (a) In a labor market where wages are able to rise, an increase in the demand for labor from D_0 to D_1 leads to an increase in equilibrium quantity of labor hired from Q_0 to Q_1 and a rise in the equilibrium wage from W_0 to W_1 . (b) In a labor market where wages do not decline, a fall in the demand for labor from D_0 to D_1 leads to a decline in the quantity of labor demanded at the original wage (W_0) from Q_0 to Q_2 . These workers will want to work at the prevailing wage (W_0), but will not be able to find jobs.

This analysis helps to explain the connection noted earlier: that unemployment tends to rise in recessions and to decline during expansions. The overall state of the economy shifts the labor demand curve and, combined with wages that are "sticky downwards", unemployment changes. The rise in unemployment that occurs because of a recession is cyclical unemployment.

Key Concepts and Summary

Cyclical unemployment rises and falls with the business cycle. In a labor market with flexible wages, wages will adjust in such a market so that quantity demanded of labor always equals the quantity supplied of labor at the equilibrium wage. Many theories have been proposed for why wages might not be flexible, but instead may adjust only in a "sticky" way, especially when it comes to downward adjustments: implicit contracts, efficiency wage theory, adverse selection of wage cuts, insider-outsider model, and relative wage coordination.

Self-Check Questions

Exercise:

Problem:

Beginning in the 1970s and continuing for three decades, women entered the labor force in a big way. If we assume that wages are sticky in a downward direction, but that around 1970 the demand for labor equalled the supply of labor at the current wage rate, what do you imagine happened to the wage rate, employment, and unemployment as a result of increased labor force participation?

Solution:

Because of the influx of women into the labor market, the supply of labor shifts to the right. Since wages are sticky downward, the increased supply of labor causes an increase in people looking for jobs (Q_s), but no change in the number of jobs available (Q_e). As a result, unemployment increases by the amount of the increase in the labor supply. This can be seen in the following figure.

Over time, as labor demand grows, the unemployment will decline and eventually wages will begin to increase again. But this increase in labor demand goes beyond the scope of this problem.

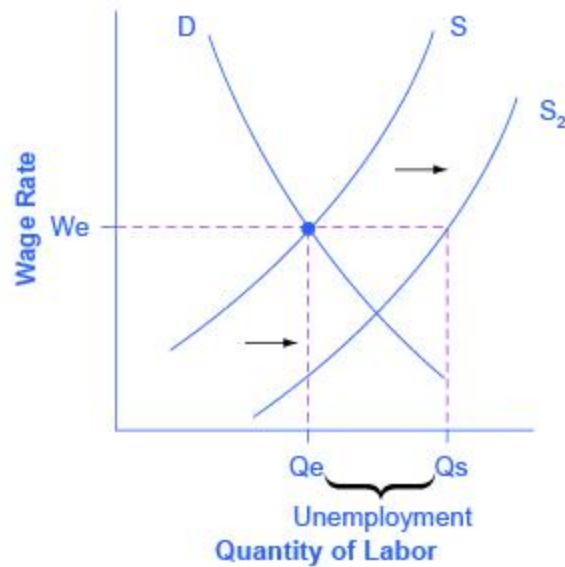


Figure 8.

Review Questions

Exercise:

Problem:

When would you expect cyclical unemployment to be rising? Falling?

Exercise:

Problem:

Why is there unemployment in a labor market with flexible wages?

Exercise:

Problem:

Name and explain some of the reasons why wages are likely to be "sticky", especially in downward adjustments.

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Sticky Wage Theory. 2016. Investopedia. Available:
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Glossary

adverse selection of wage cuts argument
if employers reduce wages for all workers, the best will leave

cyclical unemployment
unemployment closely tied to the business cycle, like higher unemployment during a recession

efficiency wage theory
the theory that the productivity of workers, either individually or as a group, will increase if they are paid more

implicit contract
an unwritten agreement in the labor market that the employer will try to keep wages from falling when the economy is weak or the business is having trouble, and the employee will not expect huge salary increases when the economy or the business is strong

insider-outsider model
those already working for the firm are “insiders” who know the procedures; the other workers are “outsiders” who are recent or prospective hires

relative wage coordination argument
across-the-board wage cuts are hard for an economy to implement, and workers fight against them

What Causes Changes in Unemployment over the Long Run

By the end of this section, you will be able to:

- Explain frictional and structural unemployment
- Assess relationships between the natural rate of employment and potential real GDP, productivity, and public policy
- Identify recent patterns in the natural rate of employment
- Propose ways to combat unemployment

Cyclical unemployment explains why unemployment rises during a recession and falls during an economic expansion. But what explains the remaining level of unemployment even in good economic times? Why is the unemployment rate never zero? Even when the South African economy might be growing strongly, the unemployment rate - at least since the dawn of democracy in 1994 - has never fallen below 20%. South Africa is not alone in this experience with even some European countries like Greece, Spain, Italy and France often also experiencing double digit unemployment rates in the last few decades. Why does some level of unemployment persist even when economies are growing strongly? Why are unemployment rates continually higher in certain economies, through good economic years and bad? Economists have a term to describe the remaining level of unemployment that occurs even when the economy is healthy: it is called the **natural rate of unemployment**.

The Long Run: The Natural Rate of Unemployment

The natural rate of unemployment is not “natural” in the sense that water freezes at zero degrees Celsius or boils at 100 degrees Celsius at sea level. It is not a physical and unchanging law of nature. Instead, it is only the “natural” rate because it is the unemployment rate that would result from the combination of economic, social, and political factors that exist at a time—assuming the economy was neither booming nor in recession. These forces include the usual pattern of companies expanding and contracting their workforces in a dynamic economy, social and economic forces that affect the labor market, or public policies that affect either the eagerness of

people to work or the willingness of businesses to hire. Let's discuss these factors in more detail.

Frictional Unemployment

In a market economy, some companies are always going broke for a variety of reasons: old technology; poor management; good management that happened to make bad decisions; shifts in tastes of consumers so that less of the firm's product is desired; a large customer who went broke; or tough domestic or foreign competitors. Conversely, other companies will be doing very well for just the opposite reasons and looking to hire more employees. In a perfect world, all of those who lost jobs would immediately find new ones. But in the real world, even if the number of job seekers is equal to the number of job vacancies, it takes time to find out about new jobs, to interview and figure out if the new job is a good match, to find a new place to live nearer the new job. The unemployment that occurs in the meantime, as workers move between jobs, is called **frictional unemployment**.

Frictional unemployment is not inherently a bad thing. It takes time on part of both the employer and the individual to match those looking for employment with the correct job openings. For individuals and companies to be successful and productive, you want people to find the job for which they are best suited, not just the first job offered.

Of course, it would be preferable if people who were losing jobs could immediately and easily move into the new jobs being created, but in the real world, that is not possible. Someone who is laid off by a textile factory in Durban cannot turn around and immediately start working for a textile factory in Johannesburg. Instead, the adjustment process happens in ripples. Some people find new jobs near their old ones, while others find that they must move to new locations. Some people can do a very similar job with a different company, while others must start new career paths. Some people may be near retirement and decide to look only for part-time work, while others want an employer that offers a long-term career path. The frictional unemployment that results from people moving between jobs in a dynamic economy is usually a small percent (maybe 1-2%?) of total unemployment. It is generally not a serious cause of unemployment.

The level of frictional unemployment will depend on how easy it is for workers to learn about alternative jobs, which may reflect the ease of communications about job prospects in the economy. The extent of frictional unemployment will also depend to some extent on how willing people are to move to new areas to find jobs—which in turn may depend on history and culture.

Frictional unemployment and the natural rate of unemployment also seem to depend on the age distribution of the population. Unemployment rates are typically lower for people between 25–54 years of age than they are for those who are either younger or older. “Prime-age workers,” as those in the 25–54 age bracket are sometimes called, are typically at a place in their lives when they want to have a job and income arriving at all times. But some proportion of those who are under 30 may still be trying out jobs and life options and some proportion of those over 55 are looking towards retirement. In both cases, the relatively young or old tend to worry less about unemployment than those in-between, and their periods of frictional unemployment may be longer as a result. Thus, a society with a relatively high proportion of relatively young or old workers will tend to have a higher unemployment rate than a society with a higher proportion of its workers in middle age.

Seasonal unemployment

This type of unemployment is self-explanatory. It particularly affects certain industries such as agriculture, tourism and construction. Thus, for example, when the banana season is over, workers hired to pick bananas will be unemployed until the next season. Similarly, hotels and restaurants require a lot of staff during the holiday periods but when people get back to work, business dies down and staff may be laid off. Construction work often lasts only until the current project is complete or it might be affected by poor weather such as storms and flooding and then work must be suspended. Drought conditions might also affect enterprises such as farming and even manufacturing industries that require a lot of water. Not much can be done about this type of unemployment and so it is also regarded as a “natural” type of unemployment that will recur as regularly as the seasons.

Structural Unemployment

Another factor that influences the natural rate of unemployment is the amount of **structural unemployment**. Structural unemployment refers to the overall inability of the economy - due to structural imbalances - to provide employment for the total labour force even at the peak of the business cycle. The structurally unemployed include individuals who have no jobs because they lack skills valued by the labor market, either because demand has shifted away from the skills they do have, or because they never learned any skills. An example of the former would be the unemployment among miners following the closure of low-yielding gold mines. An example of the latter would be high school or university dropouts.

Some people worry that technology causes structural unemployment. In the past, new technologies have put lower skilled employees out of work, but at the same time they create demand for higher skilled workers to use the new technologies. Education seems to be the key in minimizing the amount of structural unemployment. Individuals who have degrees or who have literacy, numeracy, language or technical skills can be retrained if they become structurally unemployed. For people with no skills and little education, that option is more limited. In South Africa's case, however, a primary cause of the country's structural unemployment is poor education standards and policy (Kirk: 2011). It has been suggested that the quality of schooling and training in South Africa is of such a generally poor standard that school leavers and graduates are effectively often unemployable.

Other examples of structural unemployment could include unemployment caused by various types of discrimination such as gender, race and age. Thus women have traditionally struggled to find employment in certain industries and professions. Younger workers might be preferred to older ones and employment opportunities may, either formally (e.g. by law such as affirmative action statutes) or informally, be reserved for certain groups. It has also been strongly suggested that South Africa's excessive labor legislation is exacerbating local unemployment (Unemployment because of SA labour laws: 2014). The argument is that employers are wary of employing labor because then they will become legally liable should they

ever need to retrench or dismiss workers. So to avoid legal problems associated with labor, they simply do not employ as much labor as they could, preferring technological solutions such as automation instead.

Natural Unemployment and Potential Real GDP

The natural unemployment rate is related to two other important concepts: full employment and potential real GDP. The economy is considered to be at full employment when the actual unemployment rate is equal to the natural unemployment. When the economy is at full employment, real GDP is equal to potential real GDP. By contrast, when the economy is below full employment, the unemployment rate is greater than the natural unemployment rate and real GDP is less than potential. Finally, when the economy is above full employment, then the unemployment rate is less than the natural unemployment rate and real GDP is greater than potential. Operating above potential is only possible for a short while, since it effectively means all workers are working overtime (which obviously cannot be a long term solution).

Productivity Shifts and the Natural Rate of Unemployment

Unexpected shifts in productivity can have a powerful effect on the natural rate of unemployment. Over time, the level of wages in an economy will be determined by the productivity of workers. After all, if a business paid workers more than could be justified by their productivity, the business will ultimately lose money and go bankrupt. Conversely, if a business tries to pay workers less than their productivity then, in a competitive labor market, other businesses will find it worthwhile to hire away those workers and pay them more.

However, adjustments of wages to productivity levels will not happen quickly or smoothly. Wages are typically reviewed only once or twice a year. In many modern jobs, it is difficult to measure productivity at the individual level. For example, how precisely would one measure the quantity produced by an accountant who is one of many people working in the tax department of a large corporation? Because productivity is difficult to observe, wage increases are often determined based on recent experience

with productivity; if productivity has been rising at, say, 2% per year, then wages rise at that level as well. However, when productivity changes unexpectedly, it can affect the natural rate of unemployment for a time.

Average levels of unemployment will tend to be somewhat higher on average when productivity is unexpectedly low, and conversely, will tend to be somewhat lower on average when productivity is unexpectedly high. But over time, wages do eventually adjust to reflect productivity levels.

A Preview of Policies to Fight Unemployment

The remedy for unemployment will depend on the diagnosis of the cause of the unemployment. Unemployment may have its origin either on the labor demand side or on the labor supply side (or possibly on both the demand and supply sides).

Supply side measures to reduce unemployment

A rapid increase in population may ultimately result in a larger labor force and therefore a greater supply of labor. One policy solution to unemployment in this instance is take steps to limit the population growth rate. However, this would only be a long term solution since it would take time to somehow convince people to have fewer children and a longer time before such a step affected the labor supply. A possible shorter term alternative might be to limit immigration. This is a morally and politically sensitive matter and is not always constructive since immigrants tend to be hard working and often skilled people who create economic opportunity wherever they go. So by limiting immigration, a country may be harming its own economic growth potential.

Perhaps a more constructive way to address the excessive supply of unskilled labor causing unemployment is to reduce it by educating and training more people and equipping them with relevant skills to participate productively in the economy. There is evidence of this type of intervention/policy by government in the annual subsidies and grants it makes to universities, FET colleges and other higher education and training institutions in South Africa - all in the name of attempting to reduce the

supply of unskilled labor and increase the supply of skilled labor in the country.

Demand side measures to reduce unemployment

On the labor demand side, additional employment opportunities may be created by increasing the aggregate demand for goods and services and also possibly by raising the labor intensity of production (that is, using more labour in place of automation).

Declining aggregate demand for goods and services may be clearly observed in the downswing and trough phases of the business cycle resulting, predictably, in cyclical unemployment. Remember that firms' demand for labor is a derived demand (derived from the demand for goods and services they produce). Cyclical unemployment is a short-term problem, caused because the economy is in a recession. Thus, the preferred solution will be to avoid or minimize recessions. This policy can be enacted by stimulating the overall buying power in the economy, so that firms perceive that sales and profits are possible, which makes them eager to hire.

Total (aggregate) spending/demand in the economy could be stimulated either by reducing taxes and/or increasing government spending. This is termed **fiscal policy**. Alternatively the general level of interest rates could be reduced to encourage more borrowing by all sectors in the economy and hence more spending/demand. This is termed **monetary policy**. We will revisit both fiscal and monetary policy in more detail elsewhere in this book.

Dealing with the natural rate of unemployment is trickier (frictional, seasonal and structural). There is not much to be done about the fact that in a market-oriented economy, firms will hire and fire workers. Neither can much can be done about God's seasons causing temporary unemployment in various industries each year. Nor is there much to be done about how the evolving age structure of the economy, or unexpected shifts in productivity, will affect the natural rate of unemployment for a time. However government policy can affect the natural rate of unemployment (especially frictional and structural) that will persist even when GDP is growing.

One option might be for government to consider special employment programmes. These are aimed at employing as much labor as possible to build and maintain infrastructure such as roads, water reticulation systems, sewerage systems, dams and environmental clean-up operations (e.g. clearing rivers of alien vegetation). These tend to be short term solutions however and are sustained only by tax revenue.

Government could also consider encouraging small businesses as well as the informal sector. By reducing restrictive legislation (such as the need for business licenses), more entrepreneurs might find it easier to start businesses and so hire more labor. Government could further encourage the establishment of small businesses by means of tax incentives and/or subsidies. Finally, government could also review and revise where necessary its labor legislation so that employers are less afraid of the legal implications of hiring labor. All of these measures could go some way to promoting the demand for labor and thus reducing the unemployment rate.

Note:

The Mysterious Case of the Missing Candidates

After reading the chapter you might think South Africa's current serious unemployment problem may be due to structural unemployment. Indeed, there is a mismatch between the skills employers are seeking and the skills the unemployed possess. But Cappelli (2012) has a slightly different view on this. It is called the purple squirrel. The what?

In human resource language, a "purple squirrel" is a job candidate who is a perfect fit for all of the many different responsibilities of a position. A "purple squirrel" candidate could step into a multi-faceted position with no training and permit the firm to higher fewer people because the worker is so versatile. Today managers with relatively little HR experience are drafting job descriptions and requirements. Cappelli stated in a 2012 Knowledge@Wharton interview about the findings in his book, *Why Good People Can't Find Jobs: Chasing After the Purple Squirrel* - "It turns out it's typically the case that employers' requirements are crazy, they're not paying enough, or their applicant screening is so rigid that nobody gets through," In short, managers are searching for "purple squirrels" when

what they really need are just versatile workers. There really is not a shortage of “normal squirrels”— candidates who are versatile workers. The managers just cannot find them because their requirements, screening processes, and compensation are all focused on trying to get the “purple” ones.

Key Concepts and Summary

The natural rate of unemployment is the rate of unemployment that would be caused by the economic, social, and political forces in the economy even when the economy is not in a recession. These factors include the frictional unemployment that occurs when people are put out of work for a time by the shifts of a dynamic and changing economy and any laws concerning conditions of hiring and firing that have the undesired side effect of discouraging job formation. They also include structural unemployment, which occurs when demand shifts permanently away from a certain type of job skill.

Self-Check Questions

Exercise:

Problem:

Is the increase in labor force participation rates among women better thought of as causing an increase in cyclical unemployment or an increase in the natural rate of unemployment? Why?

Solution:

The increase in labor supply was a social demographic trend—it was not caused by the economy falling into a recession. Therefore, the influx of women into the work force increased the natural rate of unemployment.

Exercise:

Problem:

Many university students graduate from university before they have found a job. When graduates begin to look for a job, they are counted as what category of unemployed?

Solution:

New entrants to the labor force, whether from university or otherwise, are counted as frictionally unemployed until they find a job.

Review Questions**Exercise:****Problem:**

What term describes the remaining level of unemployment that occurs even when the economy is healthy?

Exercise:**Problem:**

What forces create the natural rate of unemployment for an economy?

Exercise:**Problem:**

Would you expect the natural rate of unemployment to be roughly the same in different countries?

Exercise:**Problem:**

Would you expect the natural rate of unemployment to remain the same within one country over the long run of several decades?

Exercise:

Problem:

What is frictional unemployment? Give examples of frictional unemployment.

Exercise:

Problem:

What is structural unemployment? Give examples of structural unemployment.

Exercise:

Problem:

After several years of economic growth, would you expect the unemployment in an economy to be mainly cyclical or mainly due to the natural rate of unemployment? Why?

Exercise:

Problem:

What type of unemployment (cyclical, frictional, or structural) applies to each of the following:

- A. landscapers laid off in response to drop in new housing construction during a recession.
- B. coal miners laid off due to EPA regulations that shut down coal fired power
- C. a financial analyst who quits his/her job in Sandton and is pursuing similar work in Cape Town
- D. printers laid off due to drop in demand for printed catalogues and flyers as firms go on the internet to promote and advertise their products online instead.
- E. factory workers in South Africa laid off as the plants shut down and move to Mexico and Ireland.

Critical Thinking Questions

Exercise:

Problem:

Under what condition would a decrease in unemployment be bad for the economy?

Exercise:

Problem:

Under what condition would an increase in the unemployment rate be a positive sign?

Exercise 13

Is it desirable to pursue a goal of zero unemployment? Why or why not?

Exercise 14

Is it desirable to eliminate natural unemployment? Why or why not? *Hint:* Think about what our economy would look like today and what assumptions would have to be met to have a zero rate of natural unemployment.

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Glossary

frictional unemployment

unemployment that occurs as workers move between jobs

natural rate of unemployment

the unemployment rate that would exist in a growing and healthy economy from the combination of economic, social, and political factors that exist at a given time

structural unemployment

unemployment that occurs because individuals lack skills valued by employers

Introduction to Inflation
class="introduction"
Big Bucks in Zimbabwe

This bill was worth
100 billion
Zimbabwean dollars
when issued in 2008.
There were even bills
issued with a face
value of 100 trillion
Zimbabwean dollars.
The bills had
\$100,000,000,000,000
written on them.
Unfortunately, they
were almost
worthless. At one
point, 621,984,228
Zimbabwean dollars
were equal to one
U.S. dollar.
Eventually, the
country abandoned its
own currency and
allowed foreign
currency to be used
for purchases. (Credit:
modification of work
by Samantha
Marx/Flickr Creative
Commons)



Note:

A \$550 Million Loaf of Bread?

Inflation is when most prices in an entire economy are rising. More specifically inflation is a sustained (ongoing) and notable increase in the general price level. But there is an extreme form of inflation called hyperinflation. This occurred in Germany between 1921 and 1928, and more recently in Zimbabwe between 2008 and 2009. In November of 2008, Zimbabwe had an inflation rate of 79.6 billion percent. In contrast, as at May 2016, South Africa had an average annual rate of inflation of 6.1% year-on-year (South Africa inflation rate 1968-2016: 2016). Zimbabwe's inflation rate was so high it is difficult to comprehend. So, let's put it into context. It is equivalent to price increases of 98% per day. This means that, from one day to the next, prices essentially double. What is life like in an economy afflicted with hyperinflation? Not like anything you are familiar with. Prices for commodities in Zimbabwean dollars were adjusted several times *each day*. There was no desire to hold on to currency since it lost value by the minute. The people there spent a great deal of time getting rid of any cash they acquired by purchasing whatever food or other commodities they could find. At one point, a loaf of bread cost 550 million Zimbabwean dollars. Teachers were paid in the trillions a month; however this was equivalent to only one United States dollar a day.

At its height, it took 621,984,228 Zimbabwean dollars to purchase one United States dollar.

Government agencies had no money to pay their workers so they started printing money to pay their bills rather than raising taxes. Rising prices caused the government to enact price controls on private businesses, which led to shortages and the emergence of illegal/black markets. In 2009, the country abandoned its currency and allowed foreign currencies to be used for purchases.

How does this happen? How can both government and the economy fail to function at the most basic level? Before we consider these extreme cases of hyperinflation, let's first look at inflation itself.

Note:

Introduction to Inflation

In this chapter, you will learn about:

- Tracking Inflation
- How Changes in the Cost of Living are Measured
- How South Africa and Other Countries Experience Inflation
- The Confusion Over Inflation
- Inflation Indexing and Its Limitations

Inflation is a general and ongoing rise in the level of prices in an entire economy. Inflation does not refer to a change in relative prices. A relative price change occurs when you see that the price of tuition, for example, has risen but the price of laptops has fallen. Inflation, on the other hand, means that there is pressure for prices to rise in most markets in the economy. In addition, price increases in the supply-and-demand model were one-time events, representing a shift from a previous equilibrium to a new one. Inflation implies an ongoing rise in prices. If inflation happened for one year and then stopped—well, then it would not be inflation any more.

This chapter begins by showing how to combine prices of individual goods and services to create a measure of overall inflation. It discusses the historical and recent experience of inflation, both in South Africa and in other countries around the world. Other chapters in this textbook have sometimes included a note under a table or figure stating that the numbers have been adjusted for inflation (remember **real** and **nominal** GDP or GNI?). This is also the case with media articles reporting economic or financial news. In this chapter, it is time to show how to use inflation statistics to adjust other economic variables, so that you can tell how much of, say, the rise in GDP over different periods of time can be attributed to an actual increase in the production of goods and services and how much should be attributed to the fact that prices for most things have risen.

Inflation has consequences for people and firms throughout the economy, in their roles as lenders and borrowers, wage-earners, taxpayers, and consumers. The chapter concludes with a discussion of some imperfections and biases in the inflation statistics, and a preview of policies for fighting inflation that will be discussed in other chapters.

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Tracking Inflation

By the end of this section, you will be able to:

- Calculate the annual rate of inflation
- Explain and use index numbers and base years when simplifying the total quantity spent over a year for products
- Calculate inflation rates using index numbers

[missing_resource: Wimpy-Menu-1983.JPG]
Figure 1 Prices back then. Credit: (Freeman: 2010)

You have probably read about "inflation" or heard your parents or other older people talking about the "good old days" when everything seemed to cost so much less. In 2002 for example, according to Crause (2016), a 110ml can of Coke cost just R3. A hamburger, chips and milkshake combo cost R6.60. The rent for a one-bedroom flat was R770. Compare these prices with today's prices! This same trend of rising prices over time can be observed with most other goods and services. Table 1 compares prices for selected goods and services for 1994 and May of 2016.

The power of inflation does not affect just goods and services, but wages and income levels, too. The last row of Table 1 below shows that the average monthly salary in South Africa increased nearly three and a half times between 1994 and 2016. Does this mean that the average worker in South Africa is three and a half times more productive than workers back in 1994? And does it mean that the average worker in 2016 is about three and a half times better off in 2016 than back in 1994? Not likely.

[missing_resource: pricecompare.jpeg] **Table 1** Prices then and now (adapted from Statistics South Africa: 2016, and, Cost of living in South Africa: 2016).

A modern economy has millions of goods and services whose prices are continually changing due to changes in supply and demand. How can all of these shifts in price be reduced to a single inflation rate? As with many problems in economic measurement, the theoretical answer is reasonably straightforward: Prices of a variety of goods and services are combined into a single price level; the inflation rate is simply the percentage change in the price level. Applying the theory, however, involves some practical difficulties.

The Price of a Basket of Goods

To calculate the price level, economists begin with the concept of a **basket (a selection) of goods and services**, consisting of the different items individuals, businesses, or organizations typically buy. The next step is to look at how the prices of those items change over time. In thinking about how to combine individual prices into an overall price level, many people find that their first impulse is to calculate the average of the prices. Such a calculation, however, could easily be misleading because some products matter more than others.

Changes in the prices of goods on which people spend a larger share of their incomes will matter more than changes in the prices of goods for which people spend a smaller share of their incomes. For example, an increase of 10% in the rental rate on housing matters more to most people than whether the price of carrots rises by 10%. To construct an overall measure of the price level, economists calculate a weighted average of the prices of the items in the basket, where the weights are based on the actual quantities of goods and services people buy. The following Work It Out feature walks you through the steps of calculating the annual rate of inflation based on a few products.

Note:

Calculating an Annual Rate of Inflation

Consider the simple basket of goods with only three items, represented in Table 2. Say that in any given month, a university student spends money on

20 hamburgers, one bottle of aspirin, and five movies. Prices for these items over four years are given in the table through each time period (Pd). Prices of some goods in the basket may stay the same or rise or even fall. In this example, the price of movies decreased in the fourth year. Each year, the cost of buying the given basket of goods at the prices prevailing at that time is shown.

[missing_resource: pricecompare2.jpeg] **Table 2** A university student's basket of goods

To calculate the annual rate of inflation in this example:

Step 1. Find the percentage change in the cost of purchasing the overall basket of goods between the time periods. The general equation for percentage changes between two years, whether in the context of inflation or in any other calculation, is:

Equation:

$$\frac{(\text{Level in new year} - \text{Level in previous year})}{\text{Level in previous year}} = \text{Percentage change}$$

Step 2. From period 1 to period 2, the total cost of purchasing the basket of goods in Table 2 rises from R1080 to R1186. Therefore, the percentage change over this time—the inflation rate—is:

Equation:

$$\frac{(1186 - 1080)}{1080} = 0.098 = 9.8\%$$

Step 3. From period 2 to period 3, the overall change in the cost of purchasing the basket rises from R1186 to R1209. Thus, the inflation rate over this time, again calculated by the percentage change, is approximately:

Equation:

$$\frac{(1209 - 1186)}{1186} = 0.019 = 1.9\%$$

Step 4. From period 3 to period 4, the overall cost falls from R1209 to R1195. The negative inflation rate (or deflation) is thus:

Equation:

$$\frac{(1195 - 1209)}{1209} = -0.012 = -1.2\%$$

This calculation of the change in the total cost of purchasing a basket of goods takes into account how much is spent on each good. The larger impact of hamburgers shows up in the “amount spent” row, where, in all time periods, hamburgers are the largest item within the amount spent row. It is logical therefore that a change in the price of hamburgers will have a larger effect on the inflation rate experienced by this university student than will changes in the price of aspirin and movies.

Index Numbers

The numerical results of a calculation based on a basket of goods can get a little messy. The simplified example in Table 2 has only three goods. If the list of products was much longer, and more realistic prices were used, the total quantity spent over a year might be some messy-looking number like R17,147.51 or R27,654.92.

To simplify the task of interpreting the price levels for more realistic and complex baskets of goods, the price level in each period is typically reported as an **index number**, rather than as the Rand amount for buying the basket of goods. Price indices are created to calculate an overall average change in relative prices over time. To convert the money spent on the basket to an index number, economists arbitrarily choose one year to be the **base year**, or starting point from which we measure changes in prices. The base year, by definition, has an index number equal to 100. This sounds complicated, but it is really a simple mathematical trick. In the example above, say that Time Period 3 is chosen as the base year. Since the total amount of spending in that year is R1209, we divide that amount by itself (R1209) and multiply by 100. Mathematically, that is equivalent to dividing R1209 by 100 = R12.09. Doing either will give us an index in the base year of 100. Again, this is because the index number in the base year *always* has to have a value of 100. Then, to figure out the values of the index number

for the other years, we divide the Rand amounts for the other years by 12.09 as well. Note also that the Rands signs cancel out so that index numbers have no units.

Calculations for the other values of the index number, based on the example presented in Table 1 are shown in Table 2. Because the index numbers are calculated so that they are in exactly the same proportion as the total Rand cost of purchasing the basket of goods, the inflation rate can be calculated based on the index numbers, using the percentage change formula. So, the inflation rate from period 1 to period 2 would be

Equation:

$$\frac{(98.1 - 89.3)}{89.3} = 0.098 = 9.8\%$$

This is the same answer that we got when measuring inflation based on the Rand cost of the basket of goods for the same time period.

[missing_resource: indextable.jpeg]**Table 3**
Calculating Index Numbers When Period 3 is the
Base Year

The alternative method of computing a price index is to divide the value of the basket in the current year (or the year which you want to compare to the base year) by the value of the basket in the base year (year of comparison). So, let's now make Period 1 the base period. Table 4 shows the indices for Periods 2-4 relative to Period 1. Notice that the computed inflation rates are the same as in Table 3.

[missing_resource: altindex.jpeg]**Table 4**
Calculating Index Numbers Using an Alternative
Method and When Period 1 is the Base Year

Simple Price Index = (Value of basket in current year/Value of basket in base year) x 100. Inflation is measured by computing the percent increase in the price index.

If the inflation rate is the same whether it is based on Rand values or index numbers, then why bother with the index numbers? The advantage is that indexing makes it faster and easier to work out the inflation rate. If you glance at two index numbers like 107 and 110, you know automatically that the rate of inflation between the two years is about, but not quite exactly equal to, 3%. By contrast, imagine that the price levels were expressed in absolute Rands of a large basket of goods, so that when you looked at the data, the numbers were R19,493.62 and R20,009.32. Most people find it difficult to look at those kinds of numbers and say that it is a change of about 3%. However, the two numbers expressed in absolute Rands are exactly in the same proportion of 107 to 110 as the previous example. If you're wondering why simple subtraction of the index numbers wouldn't work, read the following Clear It Up feature.

Note:

Why do you not just subtract index numbers?

A word of warning: When a price index moves from, say, 107 to 110, the rate of inflation is not *exactly* 3%. Remember, the inflation rate is not derived by subtracting the index numbers, but rather through the percentage-change calculation. The precise inflation rate as the price index moves from 107 to 110 is calculated as $(110 - 107) / 107 = 0.028 = 2.8\%$. When the base year is fairly close to 100, a quick subtraction is not a terrible shortcut to calculating the inflation rate—but when precision matters down to tenths of a percent, subtracting will not give the right answer.

Two final points about index numbers are worth remembering. First, index numbers have no Rand signs or other units attached to them. Although index numbers can be used to calculate a percentage inflation rate, the index numbers themselves do not have percentage signs. Index numbers just mirror the proportions found in other data. They transform the other data so that the data are easier to work with.

Second, the choice of a base year for the index number—that is, the year that is automatically set equal to 100—is arbitrary. It is chosen as a starting point from which changes in prices are tracked. In the official inflation statistics, it is common to use one base year for a few years, and then to update it, so that the base year of 100 is relatively close to the present. But any base year that is chosen for the index numbers will result in exactly the same inflation rate as we saw in the previous example when the base year was changed from Period 3 to Period 1.

Now that we see how indexes work to track inflation, the next module will show us how the cost of living is measured.

Key Concepts and Summary

The price level is measured by using a basket of goods and services and calculating how the total cost of buying that basket of goods will increase over time. The price level is often expressed in terms of index numbers, which transform the cost of buying the basket of goods and services into a series of numbers in the same proportion to each other, but with an arbitrary base year of 100. The rate of inflation is measured as the percentage change between price levels or index numbers over time.

Self-Check Questions

Exercise 1

Table 5 shows the prices of fruit purchased by the typical university student from 2001 to 2004. What is the amount spent each year on the “basket” of fruit with the quantities shown in column 2?

[missing_resource: inflate.1] **Table 5**

Solution

To compute the amount spent on each fruit in each year, you multiply the quantity of each fruit by the price.

- 10 apples \times 50 cents each = R5.00 spent on apples in 2001.

- 12 bananas \times 20 cents each = R2.40 spent on bananas in 2001.
- 2 x 100g packets of grapes at 65 cents each = R1.30 spent on grapes in 2001.
- 1 x 50g punnet of raspberries at R2 each = R2.00 spent on raspberries in 2001.

Adding up the amounts gives you the total cost of the fruit basket. The total cost of the fruit basket in 2001 was $R5.00 + R2.40 + R1.30 + R2.00 = R10.70$. The total costs for all the other years are: 2002 = R13.80, 2003 = R15.35, 2004 = R13.61

Exercise 2

Calculate the inflation rate for fruit prices from 2001 to 2004.

Solution

The inflation rate is calculated as the percentage change in the price index from year to year. For example, the inflation rate between 2001 and 2002 is $(84.61 - 69.71) / 69.71 = 0.2137 = 21.37\%$. The inflation rates for all the years are shown in the last row of table 6, which includes the two previous answers.

[missing_resource: inflate.2] **Table 6**

Exercise 3

Edna is an elderly person with limited disposable income and wants to calculate whether she would still be able to afford to take her grandchildren on a birthday outing as she used to do. Based on the basket of goods in Table 7, by what percentage does Edna's cost of living increase between time 1 and time 2?

[missing_resource: granny.jpeg] **Table 7**

Solution

Begin by calculating the total cost of buying the basket in each time period, as shown in table 8.

[missing_resource: inflate.3]Table 8

The rise in cost of living is calculated as the percentage increase: $(2244 - 2120) / 2120 = 0.0585 = 5.85\%$.

Review Questions

Exercise 4

How is a basket of goods and services used to measure the price level?

Exercise 5

Why are index numbers used to measure the price level rather than the Rand (money) value of goods?

Exercise 6

What is the difference between the price level and the rate of inflation?

Critical Thinking Question

Exercise 7

Inflation rates, like most statistics, are imperfect measures. Can you identify some ways that the inflation rate for fruit does not perfectly capture the rising price of fruit?

Problems

Exercise 8

The index number representing the price level changes from 110 to 115 in one year, and then from 115 to 120 the next year. Since the index number increases by five each year, is five the inflation rate each year? Is the inflation rate the same each year? Explain your answer.

Exercise 9

The total price of purchasing a basket of goods in the United Kingdom over four years is: year 1=£940, year 2=£970, year 3=£1000, and year 4=£1070. Calculate two price indices, one using year 1 as the base year (set equal to

100) and the other using year 4 as the base year (set equal to 100). Then, calculate the inflation rate based on the first price index. If you had used the other price index, would you get a different inflation rate? If you are unsure, do the calculation and find out.

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Glossary

base year

arbitrary year whose value as an index number is defined as 100; inflation from the base year to other years can easily be seen by comparing the index number in the other year to the index number in the base year—for example, 100; so, if the index number for a year is 105, then there has been exactly 5% inflation between that year and the base year

basket of goods and services

a hypothetical group of different items, with specified quantities of each one meant to represent a “typical” set of consumer purchases,

used as a basis for calculating how the price level changes over time

index number

a unit-free number derived from the price level over a number of years, which makes computing inflation rates easier, since the index number has values around 100

inflation

a general and ongoing rise in the level of prices in an economy

How Changes in the Cost of Living are Measured

By the end of this section, you will be able to:

- Use the Consumer Price Index (CPI) to calculate U.S. inflation rates
- Identify several ways the Bureau of Labor Statistics avoids biases in the Consumer Price Index (CPI)
- Differentiate among the Consumer Price Index (CPI), the Producer Price Index (PPI), the International Price Index, the Employment Cost Index, and the GDP deflator.

[missing_resource: toiletman.jpeg] **Figure 1**
Are things this bad?!

The most commonly cited measure of inflation in South Africa is the **Consumer Price Index (CPI)**. The CPI is calculated by government statisticians at Statistics South Africa. The South African CPI has two important objectives. The first is to measure inflation in the economy so that macroeconomic policy is based on up-to-date price information and to provide a deflator of consumer expenditure in the expenditure national accounts. The second, equally important objective, is to measure changes in the cost of living of South African households to ensure equity in the measures taken to adjust wages, grants, service agreements and contracts (Statistics South Africa: 2013a).

History of CPI in South Africa

The South African CPI dates back to 1917 and covered large urban areas only although, since 1997, smaller urban areas were also included. The CPIX (CPI excluding interest rates on mortgage bonds) was introduced in January 1997 as South Africa's main inflation measure. However, the CPIX was discontinued in 2009 and the CPI for all urban areas was announced as a headline inflation measure and also used as an inflation target measure (Statistics South Africa: 2013a).

Before January 2006, all prices of goods and services were collected from the head office of Statistics South Africa mainly by means of the postal service. Subsequently a direct collection methodology that entailed

collecting prices of goods directly by visiting retail outlets, was tested in July 2004. This direct collection methodology was then rolled out to each region. Since January and June 2006, the CPI has been compiled using the prices of goods from the direct collection methodology in both the metropolitan (primary) areas and in the urban (secondary) areas (Statistics South Africa: 2013a).

How is the CPI compiled?

Surveys are conducted monthly of about 70,000 prices which are collected in 26 different urban areas and then aggregated to calculate the headline CPI (Kelly: 2013). There is significant interest in how inflation affects rural as opposed to urban populations, as well as how it affects different income groups. It is for this reason that Statistics South Africa produces a CPI for five different expenditure groups, for pensioners and for 13 individual large cities. Statistics South Africa has also extended its price collection activities to the informal sector.

In 2013 Statistics South Africa released the first edition of a newly re-weighted consumer price index (CPI) with a revised basket of goods and services. The weights and basket of the CPI (summarized in Table 1) are based on the spending patterns of consumers. Since consumers over time change what they buy, and how much they spend on different types of items, these adjustments must be factored into the CPI to ensure its continued relevance, particularly for monetary policy decisions (Kelly: 2013).

[missing_resource: cpiwait.jpeg]**Table 1** CPI Weightings, 2012 (adapted from Statistics South Africa: 2013b)

The spending trends of the average South African household have changed in the past few years as prices and product offerings change. The new CPI series gives greater weight to electricity (up to 4.1% from 1.7%), housing rentals (up to 4.8% from 3.5%) and medical aid premiums (up to 7.9% from 3.7%). Products whose weights have been decreased in line with reduced expenditure on these items include vehicles (down from 11.3% to 6% — in

part the result of improved methodology) and tobacco products (from 2.3% to 1.5%), among others (Kelly: 2013).

As their incomes have risen, so South African consumers reported spending 25% more (adjusted for inflation) in 2010-11 than they did in the previous survey in 2005-06 (Kelly: 2013). Kelly notes that this increase in spending power, much of it driven by the growing black middle class, is reflected in the addition of new goods and services to the basket that could be seen as "luxury" items such as drinking chocolate and filter coffee, mageu, feta cheese and mineral water. These have replaced "essentials" such as samp, dried peas and beans and frozen peas and carrots, among other things. Some of the other new additions to the rest of the basket are package holidays, services of electricians and plumbers, energy-saving light bulbs, sports boots and hair extensions. Among those items that will no longer be surveyed are portable radio/CD players, green laundry soap, candles and firewood. A total of 393 unique products and services make up the CPI basket.

The importance of Rebasing Price Indices Periodically

Changing the weights and basket of the CPI provides the opportunity to rebase (or reset/restart) the index. Rebasing is a process that sets the CPI and all its indices equal to 100 in a particular period. This is similar to restarting a race, because by bringing all indices to a common point, the historical divergences between indices of different products are eliminated. A failure to do this would put an upward bias on high-inflation items on the overall index and a downward bias on low-inflation items. The result would be a biased and inaccurate measure of inflation.

To understand the need to periodically rebase the CPI, imagine that over the past 10 years, the cost of purchasing a fixed basket of goods increased by 25% and your salary also increased by 25%. Has your personal standard of living held constant? If you do not necessarily purchase an identical fixed basket of goods every year, then an inflation calculation based on the cost of a fixed basket of goods may be a misleading measure of how your cost of living has changed. Two problems arise here: substitution bias and quality/new goods bias.

When the price of a good rises, consumers tend to purchase less of it and to seek out substitutes instead. Conversely, as the price of a good falls, people will tend to purchase more of it. This pattern implies that goods with generally rising prices should tend over time to become less important in the overall basket of goods used to calculate inflation, while goods with falling prices should tend to become more important. Consider, as an example, the steep rise in the price of electricity in South Africa (an annual average of 22% from 2008 to 2015, Anon. 2015). If consumers were utterly inflexible in their demand for electricity, this would lead to a big rise in the CPI. Alternatively, imagine that people can easily switch to gas or coal as substitute sources of energy for electricity. If this was the case then as electricity prices rise, people completely switch to other energy sources and so the CPI does not change at all.

A fixed and unchanging basket of goods assumes that consumers are locked into buying exactly the same goods, regardless of price changes—not a very likely assumption. Thus, **substitution bias**—the rise in the price of a fixed basket of goods over time—tends to overstate (upwardly bias) the rise in a consumer's true cost of living, because it does not take into account that the person can substitute away from goods whose relative prices have risen. At the same time, since the price index may not include in its basket of goods and services the products that consumers have switched to, the index does not capture their price increases. This means that the index will understate (bias downwards) any inflation that these omitted goods and services may have been subject to.

The other major problem in using a fixed basket of goods as the basis for calculating inflation is how to deal with the arrival of improved versions of older goods or altogether new goods. Consider the problem that arises if a cereal is improved by adding 12 essential vitamins and minerals—and also if a box of the cereal costs 5% more. It would clearly be misleading to count the entire resulting higher price as inflation, because the new price is being charged for a product of higher (or at least different) quality. Ideally, one would like to know how much of the higher price is due to the quality change, and how much of it is just a higher price.

Since 2013 the South African CPI has introduced quality adjustments for different products in staggered phases. The first products where quality adjustments were made are motor vehicles, cellphones, decoders, DVD players and TVs (Statistics South Africa: 2013a). Statistics South Africa will update this list as more research is conducted on other products. Statistics South Africa also performs quantity adjustments. A quantity adjustment is a type of quality adjustment where the pure change in the quantity of a product results in the adjustment of a price. Thus the quantity change may take the form of a change in the physical characteristics of the product that can easily be quantified, such as change in weight, dimensions, purity, or chemical composition of a product.

Note:

Visit this [website](#) to view a list of Ford car prices between 1909 and 1927. Consider how these prices (even if they are in US Dollars) compare to today's models. Is the product today of a different quality?



A new product can be thought of as an extreme improvement in quality—from something that did not exist to something that does. However, the basket of goods that was fixed in the past obviously does not include new goods created since then. The basket of goods and services used in the Consumer Price Index (CPI) is revised and updated over time, and so new products are gradually included. But the process takes some time.

The arrival of new goods creates problems with respect to the accuracy of measuring inflation. The reason people buy new goods, presumably, is that

the new goods offer better value for money than existing goods. Thus, if the price index leaves out new goods, it overlooks one of the ways in which the cost of living is improving. In addition, the price of a new good is often higher when it is first introduced and then declines over time. If the new good is not included in the CPI for some years, until its price is already lower, the CPI may miss counting this price decline altogether. Taking these arguments together, the **quality/new goods bias** means that the rise in the price of a fixed basket of goods over time tends to overstate the rise in a consumer's true cost of living, because it does not take into account how improvements in the quality of existing goods or the invention of new goods improves the standard of living.

The CPI and Core Inflation Index

Imagine if you were driving a company truck across the country- you probably would care about things like the prices of available roadside food and accommodation as well as the truck's operating condition. However, the manager of the firm would probably have different priorities. He would care mostly about toll fees, the prices of diesel, oil and spares and on-time performance and much less so about the food you were eating and the places you were staying. In other words, the company manager would be paying more attention to the production of the firm and the prices and costs that affect the firm's profits. He would not be so worried about the relatively minor costs of what meals you ordered or the cost of an overnight stay for the driver.

In a sense, a similar situation occurs with regard to measures of inflation. As we've learned, CPI measures prices as they affect everyday household spending. Well, a **core inflation index** is typically calculated by taking the CPI and excluding volatile (very changeable and somewhat unpredictable) economic variables. In this way, economists have a better sense of the underlying trends in prices that affect the cost of living.

Examples of excluded variables include energy and food prices, which can jump around from month to month because of the weather. South Africa does not have an official measure of core inflation although the CPI excluding food and petrol is often referred to as core inflation in South

Africa (Kelly: 2013). Temporary increases in price have no lasting impact on the rate of inflation and hence are excluded from CPI. Percent changes in **core CPI** (i.e. CPI excluding volatile food and energy prices) reflect the **real/core** inflationary pressures in the economy (i.e. the true inflationary pressure).

Prior to 2009 when it was discontinued CPIX (CPI excluding mortgage interest rates) was used by the South African Reserve Bank as the official measure of inflation. The rationale for excluding mortgage interest rates from CPI was that interest changes are a result of an administrative decision by the monetary authorities of the country and do not reflect true inflationary pressures in the economy.

Additional Price Indices: PPI and GDP Deflator

Price indices can be adapted to suit any group that has to manage the problem of rising general price levels, whether these are general or specific groups of consumers or producers.

The Producer Price Index

The PPI is used to measure changes in the **cost of production** whereas CPI is used to measure changes in the **cost of living**. Some important general differences between the two types of price indices are that the PPI does not include services, only goods. PPI also does not include VAT whereas CPI does. Similarly PPI excludes interest payments whereas these are included in the calculation of CPI.

The PPI measures changes in prices in the early stages of production, before those price changes have had time to filter through to households.

Consequently the PPI can be a useful tool to predict inflation. Thus, if the PPI is increasing then this usually means that CPI will also start to increase, possibly with a delay of some months. Alternatively, if PPI starts to decrease this can be taken as an early indication that consumer inflation will start to decrease as well as measured by a decrease in the CPI.

In early 2013 a set of five Producer Price Indexes were published with new weights and a new base year (Perkins: 2015). The new headline PPI

measures prices of final manufactured goods (goods that are ready to leave the factory floor for retailers). The remaining four PPIs measure the prices of intermediate manufactured goods (goods requiring further processing before they reach final stage); electricity and water; mining; and agriculture, forestry and fishing.

The GDP Deflator

The Gross Domestic Product (GDP) deflator is calculated as the ratio of the nominal estimates of GDP to the real estimates of GDP. It reflects the change in prices in the economy from the perspective of national accounts. Thus it is a price index that includes all the components of GDP (that is, consumption plus investment plus government plus exports minus imports). Unlike the CPI, its baskets are not fixed but it re-calculates what that year's GDP would have been worth using the base-year's prices. The GDP deflator should follow the same general trend as the two other popular price indices, i.e. the consumer price index (CPI) and the producer price index (PPI). Table 2 compares these three indices from 2002 to 2009, with 2005 as the base year (index = 100).

[missing_resource: deflator1.jpeg]**Table 2**
Comparison of South African Price Indices, 2002-
2009 (Source: Statistics South Africa: 2010)

What's the best measure of inflation? If concerned with the most accurate measure of inflation, use the GDP deflator as it picks up the prices of goods and services produced. However, it is not a good measure of cost of living as it includes prices of many products not purchased by households (for example, aircraft, fire engines, factory buildings, office complexes, and bulldozers). If one wants the most accurate measure of inflation as it impacts households, use the CPI, as it only picks up prices of products purchased by households. That is why the CPI is sometimes referred to as the cost-of-living index. PPI offers the best measure of the cost of production. The 'best' measure of inflation for a given application depends on the intended use of the data.

Key Concepts and Summary

Measuring price levels with a fixed basket of goods will always have two problems: the substitution bias, by which a fixed basket of goods does not allow for buying more of what is relatively less expensive and less of what is relatively more expensive; and the quality/new goods bias, by which a fixed basket cannot take into account improvements in quality and the advent of new goods. These problems can be reduced somewhat by, for example, allowing the basket of goods to change over time (and re-basing the index)—but they cannot be totally eliminated. The most commonly cited measure of inflation is the Consumer Price Index (CPI), which is based on a basket of goods representing what the typical consumer buys. The Core Inflation Index further breaks down the CPI by excluding volatile (very changeable) economic variables. Several price indices are not based on baskets of consumer goods. The GDP deflator is based on all the components of GDP. The Producer Price Index is based on prices of supplies and inputs bought by producers of goods and services.

Self-Check Questions

Exercise:

Problem:

Which price index would be best to use to adjust your paycheck for inflation?

Solution:

Since the CPI measures the prices of the goods and services purchased by the typical urban consumer, it measures the prices of things that people buy with their paycheck. For that reason, the CPI would be the best price index to use for this purpose.

Exercise:

Problem:

The Consumer Price Index is subject to the substitution bias and the quality/new goods bias. Are the Producer Price Index and the GDP Deflator also subject to these biases? Why or why not?

Solution:

The PPI is subject to those biases for essentially the same reasons as the CPI is. The GDP deflator picks up prices of what is actually purchased that year, so there are no biases. That is the advantage of using the GDP deflator over the CPI.

Review Questions**Exercise:****Problem:**

Why does “substitution bias” arise if the inflation rate is calculated based on a fixed basket of goods?

Exercise:**Problem:**

Why does the “quality/new goods bias” arise if the inflation rate is calculated based on a fixed basket of goods?

Critical Thinking Question**Exercise:****Problem:**

Given the national budget deficit in recent years, some economists have argued that by adjusting social security payments (state pensions, grant payments, subsidies etc.) for inflation using the CPI, recipients of these state payments are being overpaid. What is the argument being made, and do you agree or disagree with it?

Exercise:

Problem:

Why is the GDP deflator not an accurate measure of inflation as it impacts a household?

Exercise:**Problem:**

Imagine that the government statisticians who calculate the inflation rate have been updating the basic basket of goods once every 10 years, but now they decide to update it every five years. How will this change affect the amount of substitution bias and quality/new goods bias?

Exercise:**Problem:**

Describe a situation, either a government policy situation, an economic problem, or a private sector situation, where using the CPI to convert from nominal to real would be more appropriate than using the GDP deflator.

Exercise:**Problem:**

Describe a situation, either a government policy situation, an economic problem, or a private sector situation, where using the GDP deflator to convert from nominal to real would be more appropriate than using the CPI.

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Glossary

Consumer Price Index (CPI)

a measure of inflation calculated by U.S. government statisticians based on the price level from a fixed basket of goods and services that represents the purchases of the average consumer

core inflation index

a measure of inflation typically calculated by taking the CPI and excluding volatile economic variables such as food and energy prices to better measure the underlying and persistent trend in long-term prices

Employment Cost Index

a measure of inflation based on wages paid in the labor market

GDP deflator

a measure of inflation based on the prices of all the components of GDP

International Price Index

a measure of inflation based on the prices of merchandise that is exported or imported

Producer Price Index (PPI)

a measure of inflation based on prices paid for supplies and inputs by producers of goods and services

quality/new goods bias

inflation calculated using a fixed basket of goods over time tends to overstate the true rise in cost of living, because it does not take into account improvements in the quality of existing goods or the invention of new goods

substitution bias

an inflation rate calculated using a fixed basket of goods over time tends to overstate the true rise in the cost of living, because it does not take into account that the person can substitute away from goods whose prices rise by a lot

How South Africa and Other Countries Experience Inflation

By the end of this section, you will be able to:

- Identify patterns of inflation for the United States using data from the Consumer Price Index
- Identify patterns of inflation on an international level

In the last five decades or so, inflation has been fairly volatile (changeable) in the South African economy, with annual Consumer Price Index increases ranging between 1-19% between 1969 and 2015 (see Figure 2). The rate of inflation was particularly high from the mid 1970s to the early 1990s when double digit figures were experienced although this cannot be described as hyperinflation. Since about 2000, however, the rate of inflation has generally stabilized so that annual Consumer Price Index increases have mostly been kept to single figures.

Historical Inflation in the South African Economy

Figure 1 shows the level of prices in the Consumer Price Index stretching back to 1959. In this case, the base year (when the CPI is defined as 100) is set for the average level of prices that existed in 2012.

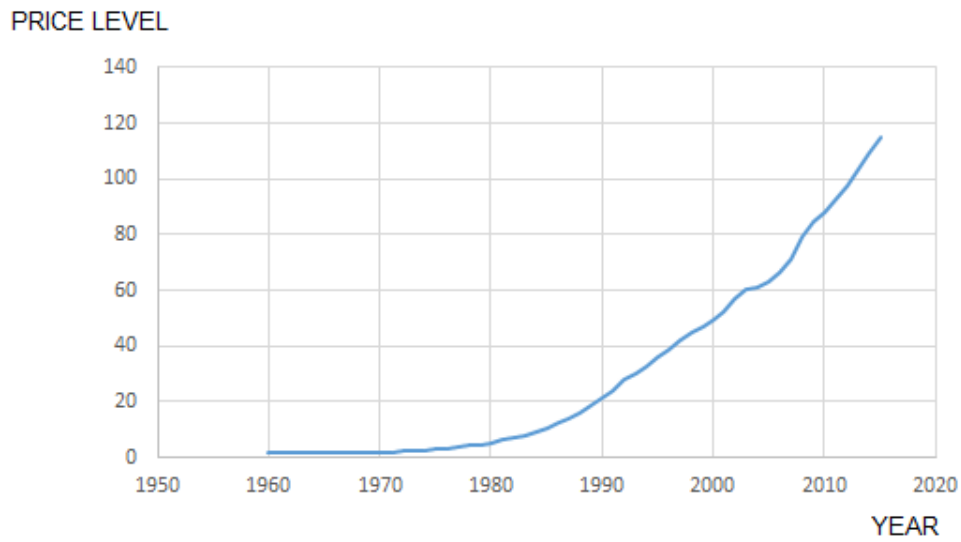


Figure 1 South African General Price Level 1969-2015, 2012 = 100 (Source: Statistics South Africa: 2016)

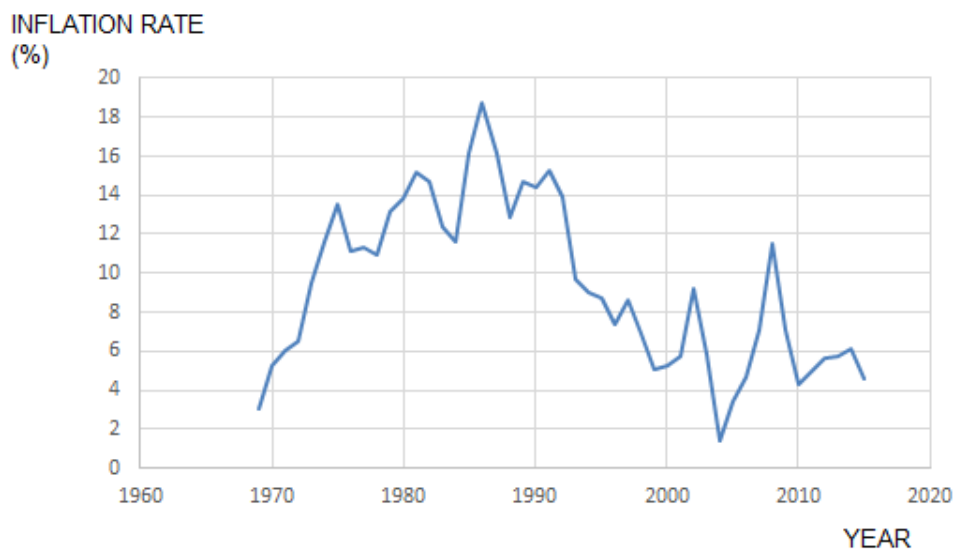


Figure 2 Annual inflation 1969-2015, 2012 = 100
(Source: Statistics South Africa: 2016)

The relatively high rate of inflation from the mid 1970s to the early 1990s can be ascribed partly to the high international oil prices experienced during this period. It is a period during which most countries experienced higher inflation than normal. However, in the case of South Africa, inflation also tended higher because of the South African government's economic policies to sustain Apartheid.

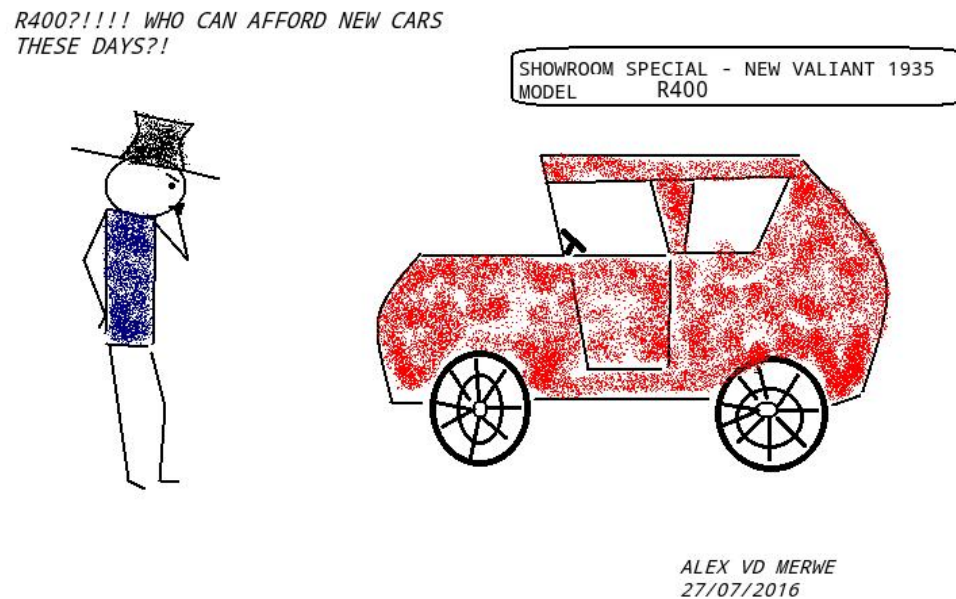


Figure 3

Note:

Visit this [website](#) to use an inflation calculator and discover how prices have changed in the last 100 years or more in South Africa.



The more you read the more you will begin to discover that the macroeconomic problems of slow or declining economic growth (recession), high unemployment and excessive inflation are linked. Recessions are typically accompanied by higher levels of unemployment, and the total demand for goods falls, pulling the price level down. Conversely, the rate of inflation often, but not always, seems to start moving up when the economy is growing very strongly, like after wartime such as during the 1960s (after the Second World War). The frameworks for macroeconomic analysis, developed in other chapters, will explain why recession often accompanies higher unemployment and lower inflation, while rapid economic growth often brings lower unemployment but higher inflation. We will examine some of the causes of inflation in later chapters.

Inflation around the World

Around the rest of the world, the pattern of inflation has been very mixed. Many industrialized countries had relatively high inflation rates in the 1970s. For example, in 1975, Japan's inflation rate was over 8% and the inflation rate for the United Kingdom was almost 25%. In the 1980s, inflation rates came down in the United States and in Europe and have largely stayed down.

Countries with controlled economies in the 1970s, like the Soviet Union and China, had very low rates of measured inflation—because prices were forbidden to rise by law, except for the cases where the government deemed a price increase to be due to quality improvements. However, these countries also had perpetual shortages of goods, since forbidding prices to rise acts like a price ceiling and creates a situation where quantity

demand often exceeds quantity supplied. As Russia and China made a transition toward more market-oriented economies, they also experienced outbursts of inflation, although the accuracy of the statistics for these economies should be regarded as somewhat uncertain. Inflation in China averaged about 10% per year for much of the 1980s and early 1990s, although it has dropped off since then. Russia experienced **hyperinflation**—an outburst of high inflation—of 2,500% per year in the early 1990s, although by 2006 Russia's consumer price inflation had dipped below 10%.

Many countries in Latin America experienced raging hyperinflation during the 1980s and early 1990s, with inflation rates often well above 100% per year. In 1990, for example, both Brazil and Argentina saw inflation climb above 2000%. Certain countries in Africa experienced extremely high rates of inflation, sometimes bordering on hyperinflation, in the 1990s. Nigeria, the most populous country in Africa, had an inflation rate of 75% in 1995.

In the early 2000s, the problem of inflation appears to have diminished for most countries (including South Africa), at least in comparison to the worst times of recent decades. In recent years, the world's worst example of hyperinflation was in Zimbabwe, where at one point the government was issuing bills with a face value of \$100 trillion (in Zimbabwean dollars)—that is, the bills had \$100,000,000,000,000 written on the front, but were almost worthless. In many countries, the memory of double-digit, triple-digit, and even quadruple-digit inflation is not very far in the past.

Key Concepts and Summary

In the South African economy, the annual inflation rate in the last four decades has ranged between 1-19% per year. The periods of highest inflation in South Africa occurred between the mid 1970's and the early 1990s. Since 2000 South African inflation has generally stabilised and been limited to single figures.

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Glossary

deflation

negative inflation; most prices in the economy are falling

hyperinflation

an outburst of high inflation that is often seen (although not exclusively) when economies shift from a controlled economy to a market-oriented economy

The Confusion Over Inflation

By the end of this section, you will be able to:

- Explain how inflation can cause redistributions of purchasing power
- Identify ways inflation can blur the perception of supply and demand
- Explain the economic benefits and challenges of inflation

Economists usually oppose high inflation, but they oppose it in a milder way than many non-economists. Robert Shiller, one of 2013's Nobel Prize winners in economics, carried out several surveys in the United States during the 1990s about attitudes toward inflation. One of his questions (Shiller: 1996) asked, "Do you agree that preventing high inflation is an important national priority, as important as preventing drug abuse or preventing deterioration in the quality of our schools?" Answers were on a scale of 1–5, where 1 meant "Fully agree" and 5 meant "Completely disagree." For the United States population as a whole, 52% answered "Fully agree" that preventing high inflation was a highly important national priority and just 4% said "Completely disagree." However, among professional economists, only 18% answered "Fully agree," while the same percentage of 18% answered "Completely disagree."

No similar scientific survey of attitudes towards inflation has been conducted in South Africa as at 2015. However, it is likely that a majority (more than 50%) of South Africans would agree with the average American that fighting inflation is an important national priority. This is regardless of what economists might think. In this section we look at why inflation is so hated.

The Land of Funny Money

What are the economic problems caused by inflation, and why do economists often regard them with less concern than the general public? Read the following very short story: "The Land of Funny Money."

One morning, everyone in the Land of Funny Money awakened to find that everything denominated in money had increased by 20%. The change was

completely unexpected. Every price in every store was 20% higher. Paychecks were 20% higher. Interest rates were 20 % higher. The amount of money, everywhere from wallets to savings accounts, was 20% larger. This overnight inflation of prices made newspaper headlines everywhere in the Land of Funny Money. But the headlines quickly disappeared, as people realized that in terms of what they could actually buy with their incomes, this inflation had no economic impact. Everyone's pay could still buy exactly the same set of goods as it did before. Everyone's savings were still sufficient to buy exactly the same car, vacation, or retirement that they could have bought before. Equal levels of inflation in all wages and prices ended up not mattering much at all.

When the people in Robert Shiller's surveys explained their concern about inflation, one typical reason was that they feared that as prices rose, they would not be able to afford to buy as much. In other words, people were worried because they did not live in a place like the Land of Funny Money, where all prices and wages rose simultaneously. Instead, people live here on Planet Earth, where prices might rise while wages do not rise at all, or where wages rise more slowly than prices.

Economists have noticed that over most periods, the inflation level in prices is roughly similar to the inflation level in wages, and so they reason that, on average, over time, people's economic status is not greatly changed by inflation. If all prices, wages, and interest rates adjusted automatically and immediately with inflation, as in the Land of Funny Money, then no one's purchasing power, profits, or real loan payments would change. However, if other economic variables do not keep up exactly with inflation, or if they adjust for inflation only after a time lag, then inflation can cause three types of problems: unintended redistributions of purchasing power, blurred price signals, and difficulties in long-term planning.

Unintended Redistributions of Purchasing Power

Inflation can cause redistributions of purchasing power that hurt some and help others. People who are hurt by inflation include those who are holding a lot of cash, whether it is in a safe deposit box or in a cardboard box under the bed. When inflation happens, the buying power (the real value) of cash

is diminished even though its nominal value remains unchanged. But cash is only an example of a more general problem: anyone who has financial assets invested in a way that the nominal return does not keep up with inflation will tend to suffer from inflation. For example, if a person has money in a bank account that pays 4% interest, but inflation rises to 5%, then the real rate of return for the money invested in that bank account is a negative -1%.

Real interest rate = nominal interest rate - inflation rate

Real interest rate = 4% - 5% = -1%

The problem of a good-looking nominal interest rate being transformed into an ugly-looking real interest rate can be worsened by taxes. In South Africa income tax is charged on all income including nominal interest on any savings and investments received in Rand terms, without an adjustment for inflation. So, ignoring tax exemptions, a person who invests R10,000 and receives a 5% simple nominal annual rate of interest is taxed on the R500 received—no matter whether the inflation rate is 0%, 5%, or 10%. If inflation is 0%, then the real interest rate is 5% and the whole of the R500 is a gain in buying power. But if inflation is 5%, then the real interest rate is zero and the person had no real gain—but still owes income tax on the nominal gain anyway. If inflation is 10%, then the real interest rate is *negative* 5% and the person is actually falling behind in buying power, but would still have to pay taxes on the R500 in nominal gains. So high rates of inflation discourage people from saving.

Inflation not only punishes savers but also wage and salary earners. In progressive income tax systems, for reasons of equity (fairness), individuals generally pay a higher rate of income tax the more they earn. Low income earners falling in a lower tax bracket will pay a smaller percent of their income in tax than those whose incomes place them in a higher tax bracket. However, increasing nominal wages (in order to keep up with inflation) over time pushes people into higher tax brackets so that they end up paying more of their **nominal** income in tax even though their **real** income may not have increased (due to inflation). This has been termed "bracket creep" (income earners "creeping" into higher tax brackets) due to nominal wage

increases necessitated by inflation. Governments clearly benefit from bracket creep.

Inflation can cause unintended redistributions of **real income** for wage earners, too. Wages do typically creep up with inflation over time eventually. However, increases in wages may lag behind inflation for a year or two, since wage adjustments are often somewhat sticky and occur only once or twice a year. Moreover, the extent to which wages keep up with inflation creates insecurity for workers and may involve painful, prolonged conflicts between employers and employees. If the minimum wage is adjusted for inflation only infrequently, minimum wage workers are losing purchasing power from their nominal wages. Figure 1 shows the pattern of median monthly wage for low paid work in South Africa from 1997-2013.

The trend reveals that nominal wages increased over time to keep up with inflation but that the buying power of this increasing nominal income remained pretty much the same (real wages did not increase but remained mostly constant). This means that the nominal increase in wages over this period roughly matched inflation, but no more than this, so workers have not really been able to improve their living standards over a period of 15-16 years!

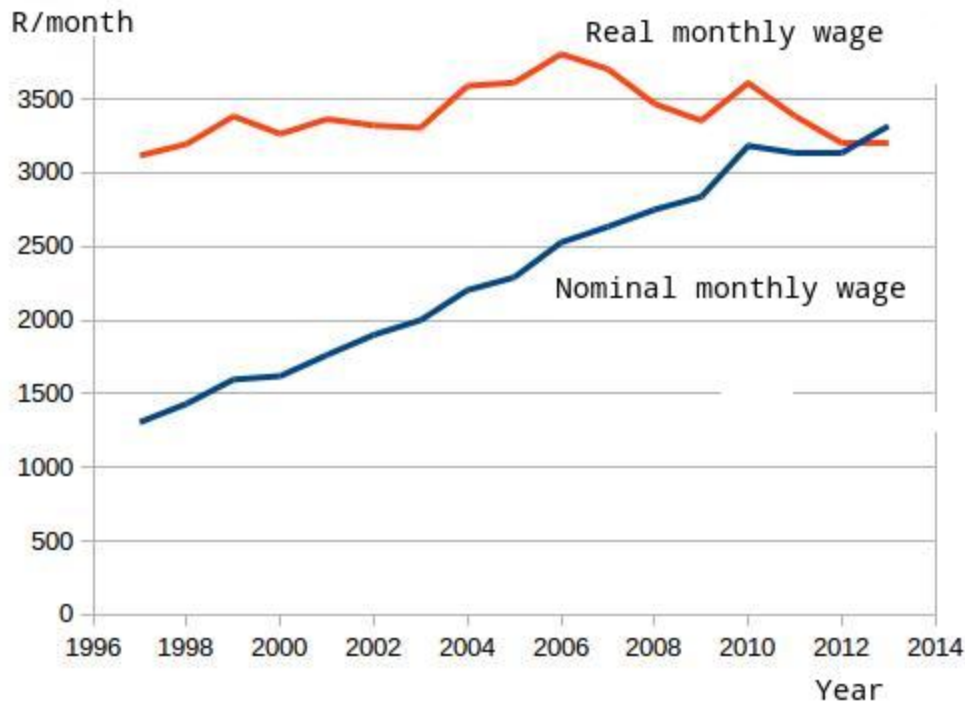


Figure 1 Real versus Nominal Median Monthly Wages of Low Paid Workers, 1997-2013 (Source: Elsely and Mthethwa: 2014)

One sizable group of people has often received a large share of their income in a form that generally does not increase over time: retirees who receive a private or state pension. Many pensions have traditionally been set as a fixed Rand amount per year at retirement. For this reason, these types of pensions are called “defined benefits” plans where the employer is obligated to pay out the amounts/benefits defined by the fund's rules. Even if inflation is low, the combination of inflation and a fixed income can create a substantial problem over time. A person who retires on a fixed income at age 65 will find that losing just 1% to 2% of buying power per year to inflation compounds to a considerable loss of buying power after a decade or two.

Fortunately, pensions and other defined benefits retirement plans are increasingly rare, replaced instead by “defined contribution” plans. In these plans, the employer contributes a fixed amount to the worker’s retirement

account on a regular basis (usually every pay check). The employee often contributes as well. The worker invests these funds in a wide range of investment vehicles. These plans are tax deferred, and they are portable so that if the individual takes a job with a different employer, their pension comes with them. To the extent that the investments made generate real rates of return (returns that are higher than the rate of inflation), retirees do not suffer as much from the inflation costs experienced by defined benefit pension funds. On balance, however, all retirees regardless of type of pension fund are net savers who live off their savings. Inflation erodes the returns on all savings and investments and is therefore very damaging to pensioners.

However, ordinary working people - just like government (through bracket creep) can sometimes actually benefit from the unintended redistributions of inflation. Consider someone who borrows R45,000 to buy a second hand car at a fixed interest rate of 9%. If inflation is 3% at the time the loan is made, then the loan must be repaid at a real interest rate of 6%. But if inflation rises to 9%, then the real interest rate on the loan is zero. In this case, the borrower's benefit from inflation is the lender's loss. A borrower paying a fixed interest rate, who benefits from inflation, is just the flip side of an investor receiving a fixed interest rate, who suffers from inflation. The lesson is that when interest rates are fixed, rises in the rate of inflation tend to penalize savers, who end up being repaid in Rands that are worth less because of inflation, while borrowers end up better off, because they can repay their loans in Rands that are worth less than originally expected. Borrowers therefore tend to benefit from high inflation.

The unintended redistributions of buying power caused by inflation may have a broader effect on society. When inflation causes a retired person who built up a pension or invested at a fixed interest rate to suffer, however, while someone who borrowed at a fixed interest rate benefits from inflation, it is hard to believe that this outcome was deserved (or fair) in any way. Similarly, when home-owners benefit from inflation because the price of their homes rises, while renters suffer because they are paying higher rent, this hardly seems to be fair. One of the reasons that inflation is so disliked by the general public is there is no sensible basis on which inflation punishes or rewards certain sections of society. For this reason it is likely to

be perceived as unfair – even dangerous, as the next Clear It Up feature shows.

Note:

Is there a connection between German hyperinflation and Hitler's rise to power?

Germany suffered an intense hyperinflation of its currency, the Mark, in the years after World War I, when the Weimar Republic in Germany resorted to printing money to pay its bills and the onset of the Great Depression created the social turmoil that Adolf Hitler could take advantage of in his rise to power. Shiller (1996) described the connection this way in a National Bureau of Economic Research Working Paper: "A fact that is probably little known to young people today, even in Germany, is that the final collapse of the Mark in 1923, the time when the Mark's inflation reached astronomical levels (inflation of 35,974.9% in November 1923 alone, for an annual rate that month of $4.69 \times 10^{28}\%$), came in the same month as did Hitler's Beer Hall Putsch, his Nazi Party's armed attempt to overthrow the German government. This failed putsch resulted in Hitler's imprisonment, at which time he wrote his book *Mein Kampf*, setting forth an inspirational plan for Germany's future, suggesting plans for world domination. . . " ". . . Most people in Germany today probably do not clearly remember these events; this lack of attention to it may be because its memory is blurred by the more dramatic events that succeeded it (the Nazi seizure of power and World War II). However, to someone living through these historical events in sequence . . . [the putsch] may have been remembered as vivid evidence of the potential effects of inflation."

Blurred Price Signals

Prices are the messengers in a market economy, conveying information about conditions of demand and supply. Inflation blurs or confuses those price messages. Inflation means that price signals are perceived more

vaguely, like a radio program received with a lot of static. If the static becomes severe, it is hard to tell what is happening.

In Israel, for example, when inflation accelerated to an annual rate of 500% in 1985, some stores stopped putting prices directly on items, since they would have had to put new labels on the items or shelves every few days to reflect inflation. Instead, a shopper just took items from a shelf and went up to the checkout register to find out the price for that day. Obviously, this situation makes comparing prices and shopping for the best deal rather difficult. When the levels and changes of prices become uncertain, businesses and individuals find it harder to react to economic signals. In a world where inflation is at a high rate, but bouncing up and down to some extent, does a higher price of a good mean that inflation has risen, or that supply of that good has decreased, or that demand for that good has increased? Should a buyer of the good take the higher prices as an economic hint to start substituting other products—or have the prices of the substitutes risen by an equal amount? Should a seller of the good take a higher price as a reason to increase production—or is the higher price only a sign of a general inflation in which the prices of all inputs to production are rising as well? The true story will presumably become clear over time, but at any given moment, who can say?

High and variable inflation means that the incentives in the economy to adjust in response to changes in prices are weaker. Markets will adjust toward their equilibrium prices and quantities more erratically and slowly, and many individual markets will experience a greater chance of surpluses and shortages.

Problems of Long-Term Planning

Inflation can make long-term planning difficult. In discussing unintended redistributions of both real and nominal income caused by inflation, we considered the case of someone trying to plan for retirement with a pension that is fixed in nominal terms and a high rate of inflation. Similar problems arise for all people trying to save for retirement, because they must consider what their money will really buy several decades in the future when the rate of future inflation cannot be known with certainty.

Inflation, especially at medium or high levels, will pose substantial planning problems for businesses, too. A firm can make money from inflation—for example, by paying bills and wages as late as possible so that it can pay in inflated Rands (with a lower real value), while collecting revenues as soon as possible. A firm can also suffer losses from inflation, as in the case of a retail business that gets stuck holding too much cash, only to see the value of that cash eroded by inflation. But when a business spends its time focusing on how to profit by inflation, or at least how to avoid suffering from it, an inevitable tradeoff strikes: less time is spent on improving products and services or on figuring out how to make existing products and services more cheaply. An economy with high inflation rewards businesses that have found clever ways of profiting from inflation, which are not necessarily the businesses that excel at productivity, innovation, or quality of service.

In the short term, low or moderate levels of inflation may not pose a big difficulty for business planning, because costs of doing business and sales revenues may rise at similar rates. If, however, inflation varies substantially over the short or medium term, then it may make sense for businesses to stick to shorter-term strategies. The evidence as to whether relatively low rates of inflation reduce productivity is controversial among economists. There is some evidence that if inflation can be held to moderate levels of less than 3% per year, it need not prevent a nation's real economy from growing at a healthy pace. For some countries that have experienced hyperinflation of several thousand percent per year, an annual inflation rate of 20–30% may feel basically the same as zero.

Any Benefits of Inflation?

Although the economic effects of inflation are primarily negative, two points are worth noting. First, the impact of inflation will differ considerably according to whether it is creeping up slowly at 0% to 2% per year, galloping along at 10% to 20% per year, or racing to the point of hyperinflation at, say, 40% per month. Hyperinflation can rip an economy and a society apart. An annual inflation rate of 2%, 3%, or 4%, however, is a long way from a national crisis. Low inflation is also better than deflation which occurs with severe recessions.

Second, an argument is sometimes made that moderate inflation may help the economy by making wages in labor markets more flexible so that employers are more willing to keep workers and perhaps even hire more labor. The discussion in the section on unemployment in Chapter 11 pointed out that wages tend to be sticky in their downward movements and that unemployment can consequently result because employees are generally not willing to take a pay cut even if the business is battling to keep going.

A little inflation could nibble away at real wages, and thus help real wages to decline if necessary. This would reduce the real cost of labor (not the nominal cost) which means that employers can afford to hang on to labor and possibly even employ more workers at the going nominal wage. In this way, even if a moderate or high rate of inflation may act as sand in the gears of the economy, perhaps a low rate of inflation serves as oil for the gears of the labor market. This argument is controversial. A full analysis would have to take all the effects of inflation into account. It does, however, offer another reason to believe that, all things considered, very low rates of inflation may not be especially harmful.

Key Concepts and Summary

Unexpected inflation will tend to hurt those whose money received, in terms of wages and interest payments, does not rise with inflation. In contrast, inflation can help those who owe money that can be paid in less valuable, inflated Rands. Low rates of inflation have relatively little economic impact over the short term. Over the medium and the long term, even low rates of inflation can complicate future planning. High rates of inflation can muddle and confuse price signals in the short term and prevent market forces from operating efficiently, and can vastly complicate long-term savings and investment decisions.

Self-Check Question

Exercise:

Problem:

If inflation rises unexpectedly by 5%, and government had borrowed money to upgrade the N3 Freeway, would it benefit or lose as a result of this inflation?

Solution:

Government would benefit because it would repay the loan in less valuable Rands (real value) than it borrowed (nominal value). Plus, tax revenues due to government would increase because of the inflation.

Review Question**Exercise:****Problem:**

Identify several different categories of people likely to be helped and hurt by inflation.

Critical Thinking Questions**Exercise:****Problem:**

If, over time, wages and salaries on average rise at least as fast as inflation, why do people worry about how inflation affects incomes?

Exercise:

Problem: Who in an economy is the big winner from inflation?

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Indexing and Its Limitations

By the end of this section, you will be able to:

- Explain the relationship between indexing and inflation
- Identify three ways the government can control inflation through macroeconomic policy

When a price, wage, or interest rate is adjusted automatically with inflation, it is said to be **indexed**. An indexed payment increases according to the index number that measures inflation (e.g. the CPI or PPI). A wide array of indexing arrangements is observed in private markets and government programs. Since the negative effects of inflation depend in large part on having inflation unexpectedly affect one part of the economy but not another—say, increasing the prices that people pay but not the wages that workers receive—indexing will take some of the sting out of inflation. So inflation **indexing** helps people to **anticipate** or expect inflation so that they can take the necessary precautions to limit its damage.

Indexing in Private Markets

In the 1970s and 1980s (a period of high inflation worldwide), trade unions commonly negotiated wage contracts that had **cost-of-living adjustments (COLAs)** which guaranteed that their wages would keep up with inflation. These contracts were sometimes written as, for example, COLA plus 3%. Thus, if inflation was 5%, the wage increase would automatically be 8%, but if inflation rose to 9%, the wage increase would automatically be 12%. COLAs are a form of indexing applied to wages even today in South Africa.

Loans advanced by lending institutions (such as banks) often have built-in inflation adjustments, too, so that if the inflation rate rises by two percentage points, then the interest rate charged on the loan rises by two percentage points as well. An **adjustable-rate mortgage (ARM)** or home loan is a kind of loan used to purchase a home in which the interest rate varies with the rate of inflation. Often, a borrower will be able receive a lower interest rate if borrowing with an ARM, compared to a fixed-rate

loan. The reason is that with an ARM, the lender is protected against the risk that higher inflation will reduce the real loan payments, and so the risk premium part of the interest rate can be correspondingly lower.

A number of ongoing or long-term business contracts also have provisions that prices will be adjusted automatically according to inflation. Sellers like such contracts because they are not locked into a low nominal selling price if inflation turns out higher than expected; buyers like such contracts because they are not locked into a high buying price if inflation turns out to be lower than expected. A contract with automatic adjustments for inflation in effect agrees on a real price to be paid, rather than a nominal price.

Indexing in Government Programs

Many government programs are indexed to inflation. The income tax codes of some countries, for example, are designed so that as a person's nominal income rises in line with inflation, they do not automatically get pushed into a higher income tax bracket where they will pay more tax even though their real income has not increased. Instead, the income levels where higher tax rates kick in are indexed to rise automatically with inflation. In South Africa the income tax code is not inflation indexed. The South African Receiver of Revenue Service has opted, rather, to widen the income tax brackets and grant more extensive income tax rebates to counter the effects of bracket creep or fiscal drag (Bechard: 2016). Yet another example of government employing inflation indexing is South Africa's social grant program. In the 2016/17 financial year, the old-age pension was increased by R90 and the child-support grant by R20 to limit the effects of inflation (South Africa. National Treasury: 2016).

[missing_resource: TAXBRACK.jpeg]Figure 1 Fighting bracket creep

Another example of a South African government program affected by indexing is its decision in 2004 to offer inflation linked or indexed bonds (RSA Retail Savings Bonds). Bonds are a means by which the government (and many private-sector companies as well) borrows money; that is,

investors buy the bonds, and then the government repays the money with interest. Traditionally, government bonds have paid a fixed rate of interest (some still do). This policy gave a government that had borrowed an incentive to encourage inflation, because it could then repay its past borrowing in inflated Rands at a lower real interest rate. But indexed bonds promise to pay a certain real rate of interest above whatever inflation rate occurs. In the case of a retired person trying to plan for the long term and worried about the risk of inflation, for example, indexed bonds that guarantee a rate of return higher than inflation—no matter the level of inflation—can be a very helpful investment.

Might Indexing Reduce Concern over Inflation?

Indexing may seem like an obviously useful step. After all, when individuals, firms, and government programs are indexed against inflation, then people can worry less about arbitrary redistributions of income and other effects of inflation.

However, some of the fiercest opponents of inflation express serious concern about indexing. They point out that indexing is always partial. Not every employer will provide Cost of Living Adjustments (COLAs) for workers. Not all companies can assume that costs and revenues will rise exactly in line with the general rates of inflation. Not all interest rates for borrowers and savers will change to match inflation exactly. But as partial inflation indexing spreads, the political opposition to inflation may diminish. After all, older people whose Social Security benefits are protected against inflation, or banks that have loaned their money with adjustable-rate loans, no longer have as much reason to care whether inflation heats up. In a world where some people are indexed against inflation and some are not, financially knowledgeable businesses and investors may seek out ways to be protected against inflation, while the financially unsophisticated and small businesses may suffer from it most.

A Preview of Policy Discussions of Inflation

This chapter has focused on how inflation is measured, historical experience with inflation, how to adjust nominal variables into real ones,

how inflation affects the economy, and how indexing works. The causes of inflation have not been discussed and government policies to deal with inflation have not been addressed at all. These issues will be taken up in depth in other chapters. However, it is useful to offer a preview here.

The cause of inflation can be summed up in one sentence: too many Rands chasing too few goods. The great surges of global inflation early in the twentieth century came after wars, which are a time when government spending is very high, but consumers have little to buy, because production is going to the war effort. Governments also commonly impose price controls during wartime. After the war, the price controls end and buying power which has been held back suddenly increases, driving up inflation. On the other hand, if too few Rands are chasing too many goods, then inflation will decline or even turn into deflation. Therefore, slowdowns in economic activity, as in major recessions and the Great Depression, are typically associated with a reduction in inflation or even outright deflation.

The policy implications are clear. If inflation is to be avoided, the amount of purchasing power in the economy must grow at roughly the same rate as the production of goods. Macroeconomic policies that the government can use to affect the amount of purchasing power—through taxes, spending, and regulation of interest rates and credit—can thus cause inflation to rise or reduce inflation to lower levels.

Note:**A Zimbabwe \$550 Million Loaf of Bread?**

As we will learn in Money and Banking, the existence of money provides enormous benefits to an economy. In a real sense, money is the lubrication that enhances the workings of markets. Money makes transactions easier. It allows people to find employment producing one product, then use the money earned to purchase the other products they need to live on.

However, too much money in circulation can lead to inflation. Extreme cases of governments recklessly printing money lead to hyperinflation as in Zimbabwe's experience. Inflation reduces the value of money.

Hyperinflation, because money loses value so quickly, ultimately results in people no longer using the official money (as in Zimbabwe's experience).

The economy reverts to barter, or it adopts another country's more stable currency, like United States dollars (as, again, in Zimbabwe's experience). In the meantime, the economy literally falls apart as people leave jobs and fend for themselves because it is not worth the time to work for money that will be worthless in a few days. For short articles and figures on Zimbabwe's record hyperinflation see Hanke (2009) and Wines (2006). Only national governments have the power to cause hyperinflation. Hyperinflation typically happens when government faces extraordinary demands for spending, which it cannot finance by taxes or borrowing. The only option is to print money—more and more of it as in Zimbabwe's experience. With more money in circulation chasing the same amount (or even less) goods and services, the only result is higher and higher prices until the economy and/or the government collapses. This is why economists are generally wary of letting inflation get out of control.

Key Concepts and Summary

A payment is said to be indexed if it is automatically adjusted for inflation. Examples of indexing in the private sector include wage contracts with cost-of-living adjustments (COLAs) and loan agreements like adjustable-rate mortgages (ARMs) or home-loans. Examples of indexing in the public sector include tax brackets, Social Grant payments and inflation-linked or indexed bonds.

Self-Check Questions

Exercise:

Problem:

How should an increase in inflation affect the interest rate on an adjustable-rate home-loan?

Solution:

Higher inflation reduces real interest rates on fixed rate home-loans. Because home-loans can be adjusted, higher inflation leads to higher interest rates on home-loans.

Exercise:

Problem:

A fixed-rate home loan has the same interest rate over the life of the loan, whether the home-loan is for 15 or 30 years. By contrast, an adjustable-rate home-loan changes with market interest rates over the life of the home-loan. If inflation falls unexpectedly by 3%, what would likely happen to a homeowner with an adjustable-rate home-loan?

Solution:

Because the home-loan has an adjustable rate, the rate should fall by 3%, the same as inflation, to keep the real interest rate the same.

Review Questions

Exercise:

Problem: What is indexing?

Exercise:

Problem:

Name several forms of indexing in the private and public sector.

Critical Thinking Questions

Exercise:

Problem:

If a government gains from unexpected inflation when it borrows, why would it choose to offer indexed bonds?

Exercise:

Problem: Do you think perfect indexing is possible? Why or why not?

Problems**Exercise:****Problem:**

If inflation rises unexpectedly by 5%, indicate for each of the following whether the economic actor is helped, hurt, or unaffected:

- a. A union member with a Cost of Living Adjustment (COLA) wage contract
- b. Someone with a large stash of cash in a safe deposit box
- c. A bank lending money at a fixed rate of interest
- d. A person who is not due to receive a pay raise for another 11 months

Exercise:**Problem:**

Rosalie knows that when she retires in 16 years, her company will give her a one-time payment of R200,000. However, if the inflation rate is 6% per year, how much buying power will that R200,000 have when measured in today's Rands? *Hint:* Start by calculating the rise in the price level over the 16 years.

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Glossary

adjustable-rate mortgage (ARM)

a loan used to purchase a home in which the interest rate varies with market interest rates

cost-of-living adjustments (COLAs)

a contractual provision that wage increases will keep up with inflation

indexed

a price, wage, or interest rate is adjusted automatically for inflation

Introduction to the Aggregate Demand/Aggregate Supply Model

class="introduction"

In this chapter, you will learn about:

- Macroeconomic Perspectives on Demand and Supply
- Building a Model of Aggregate Demand and Aggregate Supply
- Shifts in Aggregate Supply
- Shifts in Aggregate Demand
- How the AD/AS Model Incorporates Growth, Unemployment, and Inflation
- Keynes' Law and Say's Law in the AD/AS Model



Figure 1 (Source:Potter/Flickr: 2013)

Tough Times?

The financial crisis that was sparked in 2008–09 has also been referred to as the global financial crisis or the 2008-09 financial crisis. It is considered by many economists to have been the worst financial crisis since the Great Depression of the 1930s (Financial crisis of 2008-2009: 2016). Its effects were still being felt as late as 2016. Stock markets worldwide lost trillions of dollars and some large and well established financial institutions had to be saved from collapse by national governments.

The crisis played a major role in the failure of businesses initially in the USA and subsequently also in Europe and in the rest of the world. It also contributed to significant decreases in consumer wealth and has been implicated in a general downturn in economic activity globally leading to the Great Recession of 2008–2012.

Zini (2008) notes that when the financial crisis eventually hit South Africa after the USA and Europe, the country had been doing well economically and was emerging from a long period of economic expansion. The meltdown that came with the financial crisis exposed some of South Africa's long term problems: Unemployment, inequality, poverty, crime, and HIV/AIDS. Zini (2008) observes that agriculture, mining and manufacturing all declined while the trade and current account deficit (CAD) widened. Consumers were now vulnerable because they had taken on worrying levels of debt since interest rates had been so low during the good times. Inflationary pressures were also starting to build. To add to the list of problems brought about by the financial crisis, severe energy shortages erupted (inducing blackouts) and a tense political climate resulted in President Mbeki's resignation (Zini: 2008).

So exactly how did the financial crisis affect the real economy? What caused manufacturing, mining and agricultural production to shrink? Why did house prices start declining along with new vehicle sales? Why did the rate of retrenchments start increasing? What were the reasons for growing inflationary pressure following the financial crisis? Why did economic growth slow down once the financial crisis had struck? Why was the economy relatively healthy in the years leading up to the financial crisis? What are the reasons for the cyclical nature of economic activity (that is, of production and spending)?

The economic history of South Africa (even without the financial crisis) is cyclical in nature with recessions (downturns) and expansions (recoveries). Some of these fluctuations are severe, such as the economic downturn experienced during the Great Depression of the 1930's and the financial crisis of 2008-2009 which lasted several years. Why does the economy grow at different rates in different years? What are the causes of the cyclical behavior of the economy? This chapter will introduce an important model, the aggregate demand–aggregate supply model, to begin our understanding of why economies expand and contract over time.

Note:

Introduction to the Aggregate Supply–Aggregate Demand Model

In this chapter, you will learn about:

- Macroeconomic Perspectives on Demand and Supply
- Building a Model of Aggregate Supply and Aggregate Demand
- Shifts in Aggregate Supply
- Shifts in Aggregate Demand
- How the AS–AD Model Incorporates Growth, Unemployment, and Inflation
- Keynes' Law and Say's Law in the AS–AD Model

A key part of macroeconomics is the use of models to analyze macro issues and problems. How is the rate of economic growth connected to changes in the unemployment rate? Is there a reason why unemployment and inflation sometimes seem to move in opposite directions: lower unemployment and higher inflation and vice versa.

To analyze questions like these, we must move beyond discussing macroeconomic issues one at a time, and begin building economic models that will capture the relationships and interconnections between them. The next three chapters take up this task. This chapter introduces the macroeconomic model of aggregate supply and aggregate demand, how the

two interact to reach a macroeconomic equilibrium, and how shifts in aggregate demand or aggregate supply will affect that equilibrium. This chapter also relates the model of aggregate supply and aggregate demand to the three goals of economic policy (sustainable economic growth, low unemployment, and low inflation), and provides a framework for thinking about many of the connections and tradeoffs between these goals.

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Macroeconomic Perspectives on Demand and Supply

By the end of this section, you will be able to:

- Explain Say's Law and determine whether it applies in the short run or the long run
- Explain Keynes' Law and determine whether it applies in the short run or the long run

Macroeconomists over the last two centuries have often divided into two groups: those who argue that supply is the most important determinant of the size of the macroeconomy while demand just tags along, and those who argue that demand is the most important factor in the size of the macroeconomy while supply just tags along.

Say's Law and the Macroeconomics of Supply

Those economists who emphasize the role of supply in the macroeconomy often refer to the work of a famous French economist of the early nineteenth century named Jean-Baptiste Say (1767–1832). **Say's law** is: "Supply creates its own demand." As a matter of historical accuracy, it seems clear that Say never actually wrote down this law and that it oversimplifies his beliefs, but the law lives on as useful shorthand for summarizing a point of view.

The thinking behind Say's law is that each time a good or service is produced and sold, it generates income that is earned for someone: a worker, a manager, an owner, or those who are workers, managers, and owners at firms that supply inputs along the chain of production. The forces of supply and demand in individual markets will cause prices to rise and fall. The bottom line remains, however, that every sale represents income to someone, and so, Say's law argues, a given value of supply must create an equivalent value of demand somewhere else in the economy. Because Jean-Baptiste Say, Adam Smith, and other economists writing around the turn of the nineteenth century who discussed this view were known as "classical" economists, modern economists who generally subscribe to the Say's law view on the importance of supply for determining the size of the macroeconomy are called **neoclassical economists**.

If supply always creates exactly enough demand at the macroeconomic level, then (as Say himself recognized) it is hard to understand why periods of recession and high unemployment should ever occur. To be sure, even if total supply always creates an equal amount of total demand, the economy could still experience a situation of some firms earning profits while other firms suffer losses. Nevertheless, a recession is not a situation where all business failures are exactly counterbalanced by an equal number of business successes. A recession is a situation in which the economy as a whole is shrinking in size, business failures outnumber the remaining success stories, and many firms end up suffering losses and laying off workers.

Say's law that supply creates its own demand does seem a good approximation for the long run. Over periods of some years or decades, as the productive power of an economy to supply goods and services increases, total demand in the economy grows at roughly the same pace. However, over shorter time horizons of a few months or even years, recessions or even depressions occur in which firms, as a group, seem to face a lack of demand for their products.

Keynes' Law and the Macroeconomics of Demand

The alternative to Say's law, (which emphasizes supply), can be named **Keynes' law**: "Demand creates its own supply." As a matter of historical accuracy, just as Jean-Baptiste Say never wrote down anything as simple as Say's law, John Maynard Keynes never wrote down Keynes' law, but the law is a useful simplification that conveys a certain point of view.

When Keynes wrote his great work *The general theory of employment, interest, and money* during the Great Depression of the 1930s, he pointed out that during the Depression, the capacity of the economy to supply goods and services had not changed much. United States unemployment rates soared higher than 20% from 1933 to 1935, but the number of possible workers had not increased or decreased much. Factories were closed and shuttered, but machinery and equipment had not disappeared. Technologies that had been invented in the 1920s were not un-invented and forgotten in the 1930s. Thus, Keynes argued that the Great Depression—and many

ordinary recessions as well—were not caused by a drop in the ability of the economy to supply goods as measured by labor, physical capital, or technology. He argued the economy often produced less than its full potential, not because it was technically impossible to produce more with the existing workers and machines, but because a lack of demand in the economy as a whole led to inadequate incentives for firms to produce. In such cases, he argued, the level of GDP in the economy was not primarily determined by the potential of what the economy could supply, but rather by the amount of total demand.

Keynes' law seems to apply fairly well in the short run of a few months to a few years, when many firms experience either a drop in demand for their output during a recession or so much demand that they have trouble producing enough during an economic boom. However, demand cannot tell the whole macroeconomic story, either. After all, if demand was all that mattered at the macroeconomic level, then the government could make the economy as large as it wanted just by pumping up total demand through a large increase in the government spending component or by legislating large tax cuts to push up the consumption component. Economies do, however, face genuine limits to how much they can produce, limits determined by the quantity of labor, physical capital, technology, and the institutional and market structures that bring these factors of production together. These restrictions on what an economy can supply at the macroeconomic level do not disappear just because of an increase in demand.

Combining Supply and Demand in Macroeconomics

Two insights emerge from this brief outline of Say's law with its emphasis on macroeconomic supply and Keynes' law with its emphasis on macroeconomic demand. The first conclusion, which is not exactly a hot news flash, is that an economic approach focused only on the supply side or only on the demand side can be only a partial success. Both supply and demand need to be taken into account. The second conclusion is that since Keynes' law applies more accurately in the short run and Say's law applies more accurately in the long run, the tradeoffs and connections between the

three goals of macroeconomics may be different in the short run and the long run.

Key Concepts and Summary

Neoclassical economists emphasize Say's law, which holds that supply creates its own demand. Keynesian economists emphasize Keynes' law, which holds that demand creates its own supply. Many mainstream economists take a Keynesian perspective, emphasizing the importance of aggregate demand, for the short run, and a neoclassical perspective, emphasizing the importance of aggregate supply, for the long run.

Self-Check Questions

Exercise:

Problem:

Describe the mechanism by which supply creates its own demand.

Solution:

In order to supply goods, suppliers must employ workers, whose incomes increase as a result of their labor. They use this additional income to demand goods of an equivalent value to those they supply.

Exercise:

Problem:

Describe the mechanism by which demand creates its own supply.

Solution:

When consumers demand more goods than are available on the market, prices are driven higher and the additional opportunities for profit induce more suppliers to enter the market, producing an equivalent amount to that which is demanded.

Review Questions

Exercise:

Problem: What is Say's law?

Exercise:

Problem: What is Keynes' law?

Exercise:

Problem:

Do neoclassical economists believe in Keynes' law or Say's law?

Exercise:

Problem:

Does Say's law apply more accurately in the long run or the short run?
What about Keynes' law?

Critical Thinking Question

Exercise:

Problem:

Why would an economist choose either the neoclassical perspective or the Keynesian perspective, but not both?

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Glossary

Keynes' law

“demand creates its own supply”

neoclassical economists

economists who generally emphasize the importance of aggregate supply in determining the size of the macroeconomy over the long run

Say's law

“supply creates its own demand”

Building a Model of Aggregate Demand and Aggregate Supply

By the end of this section, you will be able to:

- Explain the aggregate supply curve and how it relates to real GDP and potential GDP
- Explain the aggregate demand curve and how it is influenced by price levels
- Interpret the aggregate demand/aggregate supply model
- Identify the point of equilibrium in the aggregate demand/aggregate supply model
- Define short run aggregate supply and long run aggregate supply

To build a useful macroeconomic model, we need a model that shows what determines total supply or total demand for the economy, and how total demand and total supply interact at the macroeconomic level. This model is called the **aggregate demand/aggregate supply model**. This module will explain aggregate supply, aggregate demand, and the equilibrium between them. The following modules will discuss the causes of shifts in aggregate supply and aggregate demand.

The Aggregate Supply Curve and Potential GDP

Firms make decisions about what quantity to supply based on the profits they expect to earn. Profits, in turn, are also determined by the price of the outputs the firm sells and by the price of the inputs, like labor or raw materials, the firm needs to buy. **Aggregate supply (AS)** refers to the total quantity of output (i.e. real GDP) firms will - or plan - to produce and sell. The **aggregate supply (AS) curve** shows the total quantity of output (i.e. real GDP) that firms will (or plan to) produce and sell at each price level.

Figure 1 shows an aggregate supply curve. In the following paragraphs, we will walk through the elements of the diagram one at a time: the horizontal and vertical axes, the aggregate supply curve itself, and the meaning of the potential GDP vertical line.

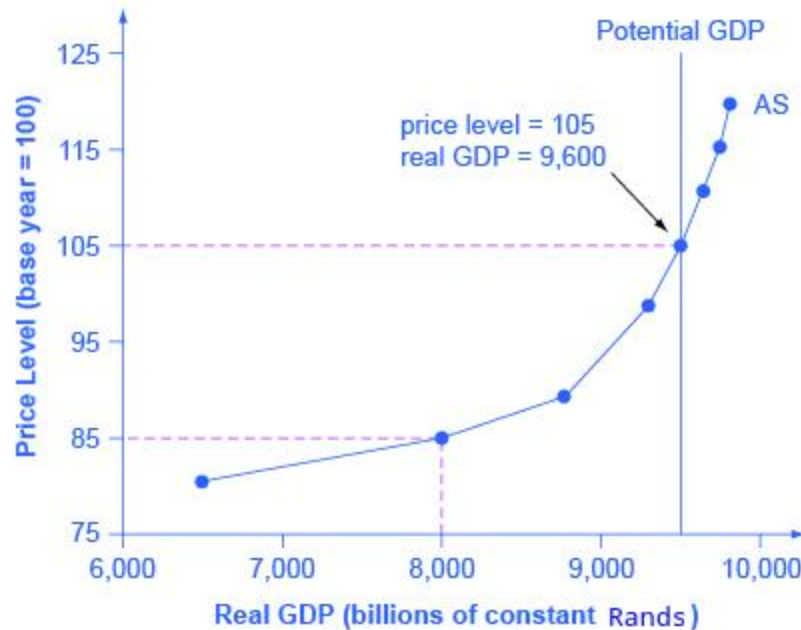


Figure 1: Aggregate supply (AS) slopes up, because as the price level for outputs rises, with the price of inputs remaining fixed, firms have an incentive to produce more and to earn higher profits. The potential GDP line shows the maximum that the economy can produce with full employment of workers and physical capital.

The horizontal axis of the diagram shows real GDP—that is, the level of GDP adjusted for inflation. The vertical axis shows the general price level. Remember that the price level is different from the inflation rate. Visualize the price level as an index number, like the CPI (Consumer Price Index), while the inflation rate is the percentage change between price levels over time.

Why is Aggregate Supply Positively Sloped?

As the general price level (the average price of all goods and services produced in the economy) rises, the aggregate (total) quantity of goods and services supplied rises as well. Why? The price level shown on the vertical axis represents prices for final goods or outputs bought in the economy—like the CPI (Consumer Price Index) — not the price level for intermediate

goods and services that are inputs to production. Thus, the AS curve describes how suppliers will react to a higher price level for final outputs of goods and services, while holding the prices of inputs like labor and energy constant. If firms across the economy face a situation where the price level of what they produce and sell is rising, but their costs of production are not rising, then the attraction of higher profits will induce them to expand production.

The slope of an AS curve changes from nearly flat at its far left to nearly vertical at its far right. At the far left of the aggregate supply curve, the level of output in the economy is far below **potential GDP**, which is defined as the quantity that an economy can produce by fully employing its existing levels of labor, physical capital, and technology, in the context of its existing market and legal institutions. At these relatively low levels of output, levels of unemployment are high, and many factories are running only part-time, or have closed their doors. In this situation, a relatively small increase in the prices of the outputs that businesses sell—while making the assumption of no rise in input prices—can encourage a considerable surge in the quantity of aggregate supply because so many workers and factories are ready to swing into production.

As the quantity produced increases, however, certain firms and industries will start running into limits: perhaps nearly all of the expert workers in a certain industry will have jobs or factories in certain geographic areas or industries will be running at full speed. In the middle area of the AS curve, a higher price level for outputs continues to encourage a greater quantity of output—but as the increasingly steep upward slope of the aggregate supply curve shows, the increase in quantity in response to a given rise in the price level will not be quite as large. (Read the following Clear It Up feature to learn why the AS curve crosses potential GDP.)

Note:

Why does AS cross potential GDP?

The aggregate supply curve is typically drawn to cross the potential GDP line. This shape may seem puzzling: How can an economy produce at an output level which is higher than its “potential” or “full employment”

GDP? The economic thinking here is that if prices for outputs were high enough, producers would make fanatical efforts to produce: all workers would be on double-overtime, all machines would run 24 hours a day, seven days a week. Such hyper-intense production would go beyond using potential labor and physical capital resources fully, to using them in a way that is not sustainable in the long term. Thus, it is indeed possible for production to sprint above potential GDP, but only in the short run.

At the far right, the aggregate supply curve becomes nearly vertical. At this quantity, higher prices for outputs cannot encourage additional output, because even if firms want to expand output, the inputs of labor and machinery in the economy are fully employed. The vertical line in the example in Fig.1 shows that potential GDP occurs at a total output of R9,500 billion. When an economy is operating at its potential GDP, machines and factories are running at capacity, and the unemployment rate is relatively low—at the natural rate of unemployment. For this reason, potential GDP is sometimes also called **full-employment GDP**.

The Aggregate Demand Curve

Aggregate (total) demand (AD) refers to the amount of total spending on domestic goods and services in an economy. (Strictly speaking, AD is what economists call total planned expenditure. This distinction will be further explained in the the Expenditure-Output Model. For now, just think of aggregate demand as total spending.) It includes all four components of demand: consumption (C), investment (I), government spending (G), and net exports (exports minus imports, X-M). This demand is determined by a number of factors, but one of them is the price level—recall though, that the price level is an index number such as the CPI (or GDP deflator) that measures the average price of the things we buy. The **aggregate demand (AD) curve** shows the total spending on domestic goods and services at each price level.

Figure 2 presents an aggregate demand (AD) curve. Just like the aggregate supply curve, the horizontal axis shows real GDP and the vertical axis

shows the price level. The AD curve slopes down, which means that increases in the price level of outputs lead to a lower quantity of total spending. The reasons behind this shape are related to how changes in the price level affect the different components of aggregate demand. The following components make up aggregate demand: consumption spending (C), investment spending (I), government spending (G), and spending on exports (X) minus imports (M): $C + I + G + X - M$.

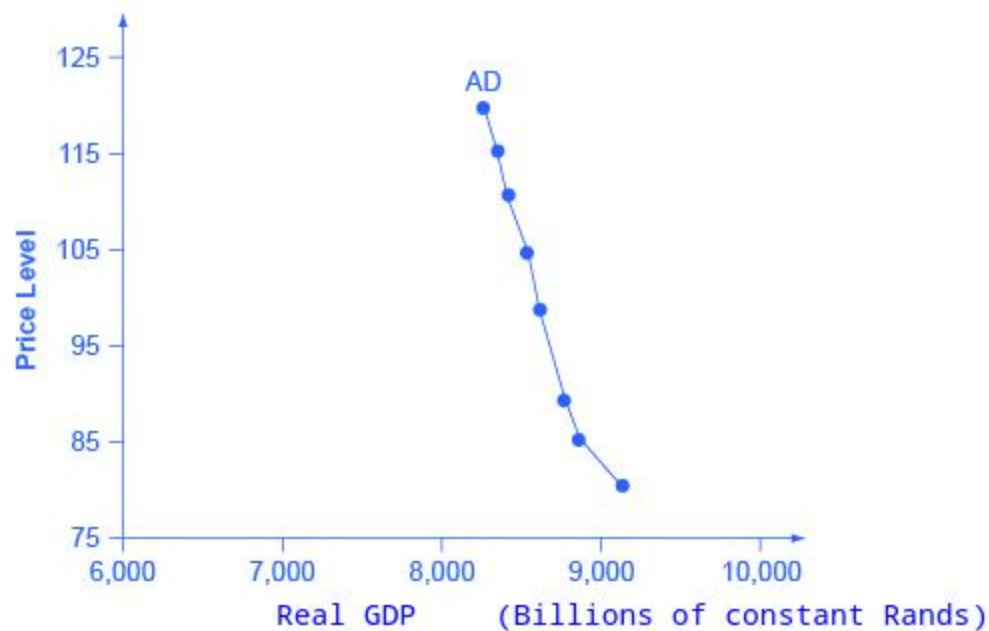


Figure 2: Aggregate demand (AD) slopes down, showing that, as the price level rises, the amount of total spending on domestic goods and services declines.

Why is Aggregate Demand Negatively Sloped?

The first reason that aggregate demand slopes downwards from left to right is the "wealth effect". The wealth effect holds that as the general price level increases, the buying power of savings that people have stored up in bank accounts and other assets will diminish, eaten away to some extent by

inflation. Because a rise in the general price level reduces people's wealth, consumption spending will fall as the price level rises.

The second reason for a negatively sloping aggregate demand curve is the "interest rate effect". The interest rate effect is that as prices for outputs rise, the same purchases will take more money or credit to accomplish. This additional demand for money and credit will push interest rates higher. In turn, higher interest rates will reduce borrowing by businesses for investment purposes and reduce borrowing by households for homes and cars—thus reducing consumption and investment spending.

A third possible reason for a downward sloping aggregate demand curve is the "foreign price effect". According to this thinking, if prices rise in South Africa, for example, while remaining fixed in other countries, then goods in South Africa will be relatively more expensive compared to goods in the rest of the world. South African exports will be relatively more expensive, and the quantity of exports sold will fall. South African imports from abroad will be relatively cheaper, so the quantity of imports will rise. Thus, a higher domestic price level, relative to price levels in other countries, will reduce net export expenditures.

The size of these three effects on aggregate demand do not seem to be very large. For this reason, the aggregate demand curve slopes downward fairly steeply; the steep slope indicates that a higher price level for final outputs reduces aggregate demand for all three of these reasons, but that the change in the quantity of aggregate demand as a result of changes in price level is not very large.

Read the following Work It Out feature to learn how to interpret the AD/AS model. In this example, aggregate supply, aggregate demand, and the price level are given for the imaginary country of Xurbia.

Note:

Interpreting the AD/AS Model

Table 1 shows information on aggregate supply, aggregate demand, and the price level for the imaginary country of Xurbia. Its currency is the Xurbian

Dollar (\$). What information does Table 1 tell you about the state of the Xurbia's economy? Where is the equilibrium price level and output level (this is the Short Run macroequilibrium)? Is Xurbia risking inflationary pressures or facing high unemployment? How can you tell?

Price Level	Aggregate Demand	Aggregate Supply
110	\$700	\$600
120	\$690	\$640
130	\$680	\$680
140	\$670	\$720
150	\$660	\$740
160	\$650	\$760
170	\$640	\$770

Price Level: Aggregate Demand/Aggregate Supply

To begin to use the AD/AS model, it is important to plot the AS and AD curves from the data provided. What is the equilibrium?

Step 1. Draw the x-axis (horizontal) and the y-axis (vertical). Label the x-axis Real GDP and the y-axis Price Level.

Step 2. Plot AD on your graph.

Step 3. Plot AS on your graph.

Step 4. Look at Figure 3 which provides a visual to aid in your analysis.

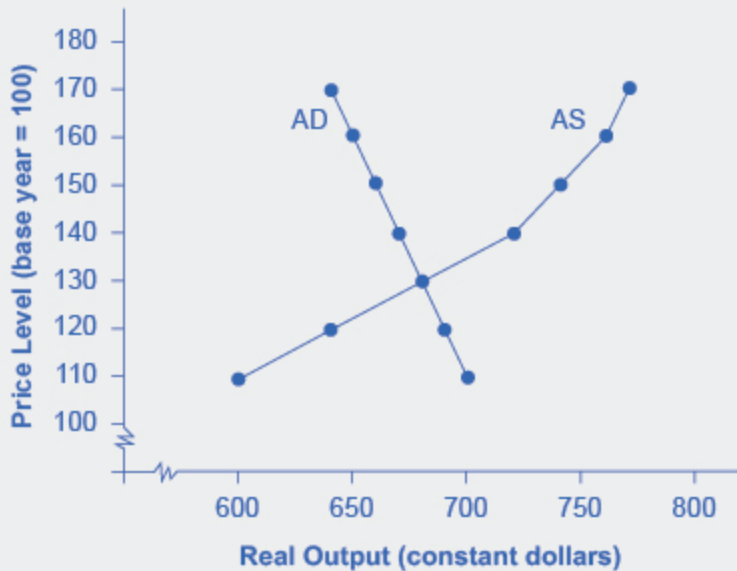


Figure 3: AD and AS curves created from the data in Table 1.

Step 5. Determine where AD and AS intersect. This is the equilibrium with price level at 130 and real GDP at \$680.

Step 6. Look at the graph to determine where equilibrium is located. We can see that this equilibrium is fairly far from where the AS curve becomes near-vertical (or at least quite steep) which seems to start at about \$750 of real output. This implies that the economy is not close to potential GDP. Thus, unemployment will be high. In the relatively flat part of the AS curve, where the equilibrium occurs, changes in the price level will not be a major concern, since such changes are likely to be small.

Step 7. Determine what the steep portion of the AS curve indicates. Where the AS curve is steep, the economy is at or close to potential GDP.

Step 8. Draw conclusions from the given information:

- If equilibrium occurs in the flat range of AS, then the economy is not close to potential GDP and will be experiencing unemployment, but will have a stable price level.
- If equilibrium occurs in the steep range of AS, then the economy is close or at potential GDP and will be experiencing rising price levels

or inflationary pressures, but will have a low unemployment rate.

Equilibrium in the Aggregate Demand/Aggregate Supply Model

The intersection of the aggregate supply and aggregate demand curves shows the equilibrium level of real GDP and the equilibrium general price level in the economy. At a relatively low general price level for output, firms have little incentive to produce, although consumers would be willing to purchase a high quantity. As the price level for outputs rises, aggregate supply rises and aggregate demand falls until the equilibrium point is reached.

Figure 4 combines the AS curve from Figure 1 and the AD curve from Figure 2 and places them both on a single diagram. In this example, the equilibrium point occurs at point E, at a price level of 90 and an output level of R8,800 billion.

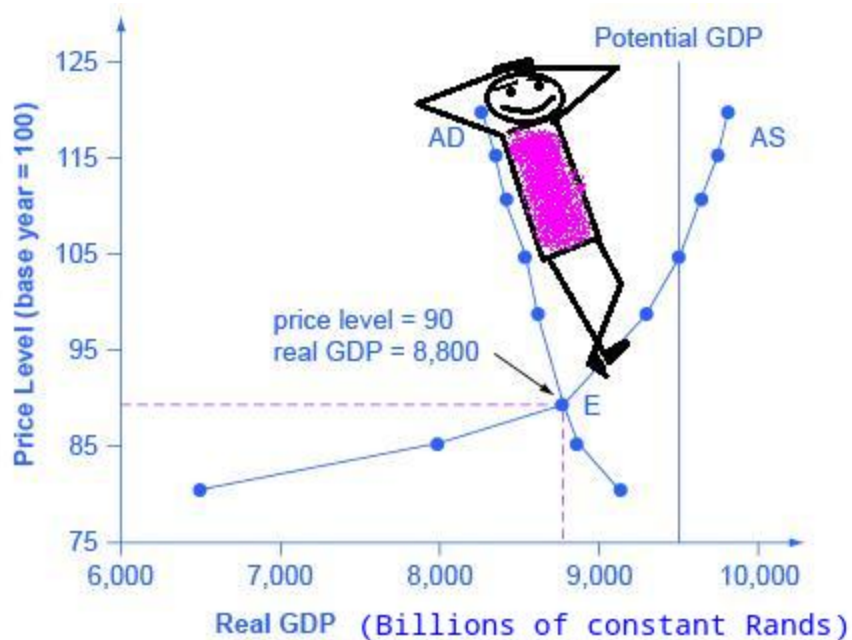


Figure 4: The equilibrium, where aggregate supply (AS) equals aggregate demand (AD), occurs at a price level of 90 and an output level of R8,800 billion.

Confusion sometimes arises between the aggregate supply and aggregate demand model and the microeconomic analysis of demand and supply in particular markets for goods, services, labor, and capital. Read the following Clear It Up feature to gain an understanding of whether AS and AD are macro or micro.

Note:

Are AS and AD macro or micro?

The aggregate supply and aggregate demand model and the microeconomic analysis of demand and supply in particular markets for goods, services, labor, and capital have some small similarities, but they also have many underlying differences.

For example, the vertical and horizontal axes have distinctly different meanings in macroeconomic and microeconomic diagrams. The vertical axis of a microeconomic demand and supply diagram expresses a price (or wage or rate of return) for an individual good or service. This price is implicitly relative: it is intended to be compared with the prices of other products (for example, the price of pizza relative to the price of fried chicken). In contrast, the vertical axis of an aggregate supply and aggregate demand diagram expresses the level of a price index like the Consumer Price Index or the GDP deflator—combining a wide array of prices from across the economy. The price level is absolute: it is not intended to be compared to any other prices since it is essentially the average price of all products in an economy. The horizontal axis of a microeconomic supply and demand curve measures the quantity of a particular good or service. In contrast, the horizontal axis of the aggregate demand and aggregate supply diagram measures GDP, which is the sum of all the final goods and services produced in the economy, not the quantity in a specific market.

In addition, the economic reasons for the shapes of the curves in the macroeconomic model are different from the reasons behind the shapes of the curves in microeconomic models. Demand curves for individual goods or services slope down primarily because of the existence of substitute goods, not the wealth effects, interest rate, and foreign price effects associated with aggregate demand curves. The slopes of individual supply and demand curves can have a variety of different slopes, depending on the extent to which quantity demanded and quantity supplied react to price in that specific market, but the slopes of the AS and AD curves are much the same in every diagram (although as we shall see in later chapters, short-run and long-run perspectives will emphasize different parts of the AS curve). In short, just because the AD/AS diagram has two lines that cross, do not assume that it is the same as every other diagram where two lines cross. The theory and meanings of the macro and micro diagrams are only distant cousins from different branches of the economics family tree.

Defining SRAS and LRAS

In the Clear It Up feature titled “Why does AS cross potential GDP?” we differentiated between short run changes in aggregate supply which are shown by the AS curve and long run changes in aggregate supply which are defined by the vertical line at potential GDP. In the short run, if demand is too low (or too high), it is possible for producers to supply less GDP (or more GDP) than potential. In the long run, however, producers are limited to producing at potential GDP. For this reason, what we have been calling the AS curve, may also be referred to as the **short run aggregate supply (SRAS) curve**. The vertical line at potential GDP may also be referred to as the **long run aggregate supply (LRAS) curve**.

Key Concepts and Summary

The upward-sloping short run aggregate supply (SRAS) curve shows the positive relationship between the price level and the level of real GDP in the short run. Aggregate supply slopes up because when the price level for outputs increases, while the price level of inputs remains fixed, the

opportunity for additional profits encourages more production. The aggregate supply curve is near-horizontal on the left and near-vertical on the right. In the long run, aggregate supply is shown by a vertical line at the level of potential output, which is the maximum level of output the economy can produce with its existing levels of workers, physical capital, technology, and economic institutions.

The downward-sloping aggregate demand (AD) curve shows the relationship between the price level for outputs and the quantity of total spending in the economy. It slopes down because of: (a) the wealth effect, which means that a higher price level leads to lower real wealth, which reduces the level of consumption; (b) the interest rate effect, which holds that a higher price level will mean a greater demand for money, which will tend to drive up interest rates and reduce investment spending; and (c) the foreign price effect, which holds that a rise in the price level will make domestic goods relatively more expensive, discouraging exports and encouraging imports.

Self-Check Questions

Exercise:

Problem:

The short run aggregate supply curve was constructed assuming that as the price of outputs increases, the price of inputs stays the same. How would an increase in the prices of important inputs, like energy, affect aggregate supply?

Solution:

Higher input prices make output less profitable, decreasing the desired supply. This is shown graphically as a leftward shift in the AS curve.

Exercise:

Problem:

In the AD/AS model, what prevents the economy from achieving equilibrium at potential output?

Solution:

Equilibrium occurs at the level of GDP where $AD = AS$. Insufficient aggregate demand could explain why the equilibrium occurs at a level of GDP less than potential. A decrease (or leftward shift) in aggregate supply could be another reason.

Review Questions**Exercise:****Problem:**

What variable appears on the horizontal axis of the AD/AS diagram?
What variable is measured on the vertical axis?

Exercise:**Problem:**

What is the economic reason why the SRAS curve slopes up?

Exercise:**Problem:**

What are the components of the aggregate demand (AD) curve?

Exercise:**Problem:**

What are the economic reasons why the AD curve slopes down?

Exercise:

Problem:

Briefly explain the reason for the near-horizontal shape of the SRAS curve on its far left.

Exercise:**Problem:**

Briefly explain the reason for the near-vertical shape of the SRAS curve on its far right.

Exercise:

Problem: What is potential GDP?

Critical Thinking Questions**Exercise:****Problem:**

On a microeconomic demand curve, a decrease in price causes an increase in quantity demanded because the product in question is now relatively less expensive than substitute products. Explain why aggregate demand does not increase for the same reason in response to a decrease in the aggregate price level. In other words, what causes total spending to increase if it is not because goods are now cheaper?

Problems**Exercise:**

Problem:

Review the problem shown in the **Work It Out** titled "Interpreting the AD/AS Model." Like the information provided in that feature, Table 2 shows information on aggregate supply, aggregate demand, and the price level for the imaginary country of Xurbia.

Price Level	AD	AS
110	700	600
120	690	640
130	680	680
140	670	720
150	660	740
160	650	760
170	640	770

Price Level: AD/AS

- Plot the AD/AS diagram from the data shown. Identify the equilibrium.
- Imagine that, as a result of a government tax cut, aggregate demand becomes higher by 50 at every price level. Identify the new equilibrium.
- How will the new equilibrium alter output? How will it alter the price level? What do you think will happen to employment?

Exercise:**Problem:**

The imaginary country of Harris Island has the aggregate supply and aggregate demand figures as shown in Table 3.

Price Level	AD	AS
100	700	200
120	600	325
140	500	500
160	400	570
180	300	620

Price Level: AD/AS

- Plot the AD/AS diagram. Identify the equilibrium.
- Would you expect unemployment in this economy to be relatively high or low?
- Would you expect concern about inflation in this economy to be relatively high or low?
- Imagine that consumers begin to lose confidence about the state of the economy, and so AD becomes lower by 275 at every price level. Identify the new aggregate equilibrium.
- How will the shift in AD affect the original output, price level, and employment?

Exercise:**Problem:**

Table 4 shows the AD / AS figures for another imaginary country called Santher

Price Level	AD	AS
50	1,000	250
60	950	580
70	900	750
80	850	850
90	800	900

Price Level: AD/AS

- Plot the AD/AS curves and identify the equilibrium.
- Would you expect unemployment in this economy to be relatively high or low?
- Would you expect prices to be a relatively large or small concern for this economy?
- Imagine that input prices fall and so AS shifts to the right by 150 units. Identify the new equilibrium.
- How will the shift in AS affect the original output, price level, and employment?

Glossary

aggregate demand (AD)

the amount of total spending on domestic goods and services in an economy

aggregate supply (AS)

the total quantity of output (i.e. real GDP) firms will produce and sell

aggregate demand (AD) curve

the total spending on domestic goods and services at each price level

aggregate supply (AS) curve

the total quantity of output (i.e. real GDP) that firms will produce and sell at each price level

aggregate demand/aggregate supply model

a model that shows what determines total supply or total demand for the economy, and how total demand and total supply interact at the macroeconomic level

full-employment GDP

another name for potential GDP, when the economy is producing at its potential and unemployment is at the natural rate of unemployment

long run aggregate supply (LRAS) curve

vertical line at potential GDP showing no relationship between the price level for output and real GDP in the long run

potential GDP

the maximum quantity that an economy can produce given full employment of its existing levels of labor, physical capital, technology, and institutions

short run aggregate supply (SRAS) curve

positive short run relationship between the price level for output and real GDP, holding the prices of inputs fixed

Shifts in Aggregate Demand

By the end of this section, you will be able to:

- Explain how imports influence aggregate demand
- Identify ways in which business confidence and consumer confidence can affect aggregate demand
- Explain how government policy can change aggregate demand
- Evaluate why economists disagree on the topic of tax cuts

As mentioned previously, the components of aggregate demand are consumption spending (C), investment spending (I), government spending (G), and spending on exports (X) minus imports (M). (Read the following Clear It Up feature for explanation of why imports are subtracted from exports and what this means for aggregate demand.) A shift of the AD curve to the right means that at least one of these components increased so that a greater amount of total spending would occur at every price level. A shift of the AD curve to the left means that at least one of these components decreased so that a lesser amount of total spending would occur at every price level. The Keynesian Perspective will discuss the components of aggregate demand and the factors that affect them. Here, the discussion will sketch two broad categories that could cause AD curves to shift: changes in the behavior of consumers or firms and changes in government tax or spending policy.

Note:

Do imports diminish aggregate demand?

We have seen that the formula for aggregate demand is $AD = C + I + G + X - M$, where M is the total value of imported goods. Why is there a minus sign in front of imports? Does this mean that more imports will result in a lower level of aggregate demand?

When a South African buys a foreign product, for example, it gets counted along with all the other consumption. So the income generated does not go to South African producers, but rather to producers in another country; it would be wrong to count this as part of domestic demand. Therefore, imports added in consumption are subtracted back out in the M term of the equation.

Because of the way in which the demand equation is written, it is easy to make the mistake of thinking that imports are bad for the economy. Just keep in mind that every negative number in the M term has a corresponding positive number in the C or I or G term, and they always cancel out.

How Changes by Consumers and Firms Can Affect AD

When consumers feel more confident about the future of the economy, they tend to consume more. If business confidence is high, then firms tend to spend more on investment, believing that the future payoff from that investment will be substantial. Conversely, if consumer or business confidence drops, then consumption and investment spending decline.

Stellenbosch University's Bureau For Economic Research (BER) publishes indices of consumer confidence as well as **business confidence** each quarter (every 3 months). Consumer confidence is measured as a net balance, which is calculated as the percentage of respondents expecting an improvement / good time to buy durable goods less the percentage expecting a deterioration / bad time to buy durable goods. The Consumer Confidence Index (CCI) can vary between -100 and 100 , but the index has fluctuated between -33 (indicating an extreme lack of confidence) and $+23$ (indicating extreme confidence) since the BER started measuring consumer confidence comprehensively in 1982 (BER: undated)

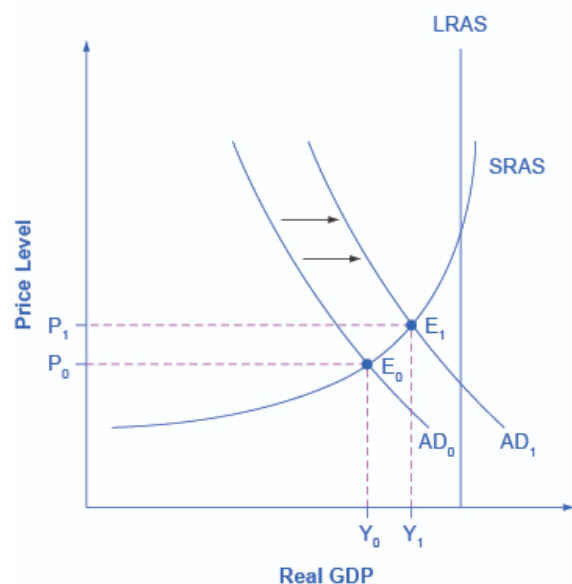
The BER's Business Confidence Index (BCI) takes the percentage of respondents that rate prevailing conditions as satisfactory as an indicator or proxy of business confidence. The composite Business Confidence Index (BCI) is the unweighted mean of five sectoral indices, namely that of manufacturers, building contractors, retailers, wholesalers and new vehicle dealers. Business confidence may vary between 0 and 100 , where 0 indicates an extreme lack of confidence, 50 neutrality and 100 extreme confidence (BER: undated).

Because a rise in confidence is associated with higher consumption and investment demand, it will lead to an outward shift in the AD curve, and a

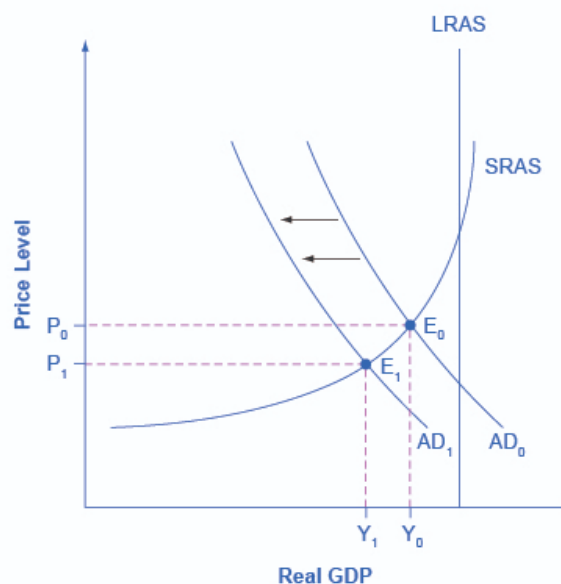
move of the equilibrium, from E_0 to E_1 , to a higher quantity of output and a higher price level, as shown in Figure 1 (a).

Consumer and business confidence often reflect macroeconomic realities; for example, confidence is usually high when the economy is growing briskly and low during a recession. However, economic confidence can sometimes rise or fall for reasons that do not have a close connection to the immediate economy, like a risk of war, election results, foreign policy events, or a pessimistic prediction about the future by a prominent public figure. South African presidents, for example, must be careful about their actions and in their public pronouncements about the economy. If they offer economic pessimism, they risk provoking a decline in confidence that reduces consumption and investment and shifts AD to the left, and in a self-fulfilling prophecy, contributes to causing the recession that the president warned against in the first place. A shift of AD to the left, and the corresponding movement of the equilibrium, from E_0 to E_1 , to a lower quantity of output and a lower price level, is shown in Figure 1 (b).

Shifts in Aggregate Demand



(a) Aggregate demand shifts right



(b) Aggregate demand shifts left

(a) An increase in consumer confidence or business confidence can shift AD to the right, from AD_0 to AD_1 . When AD shifts to the right, the new equilibrium (E_1) will have a higher quantity of output and also a higher price level compared with the original equilibrium (E_0). In

this example, the new equilibrium (E_1) is also closer to potential GDP.

An increase in government spending or a cut in taxes that leads to a rise in consumer spending can also shift AD to the right. (b) A decrease in consumer confidence or business confidence can shift AD to the left, from AD_0 to AD_1 . When AD shifts to the left, the new equilibrium (E_1) will have a lower quantity of output and also a lower price level compared with the original equilibrium (E_0). In this

example, the new equilibrium (E_1) is also farther below potential GDP.

A decrease in government spending or higher taxes that leads to a fall in consumer spending can also shift AD to the left.

How Government Macroeconomic Policy Choices Can Shift AD

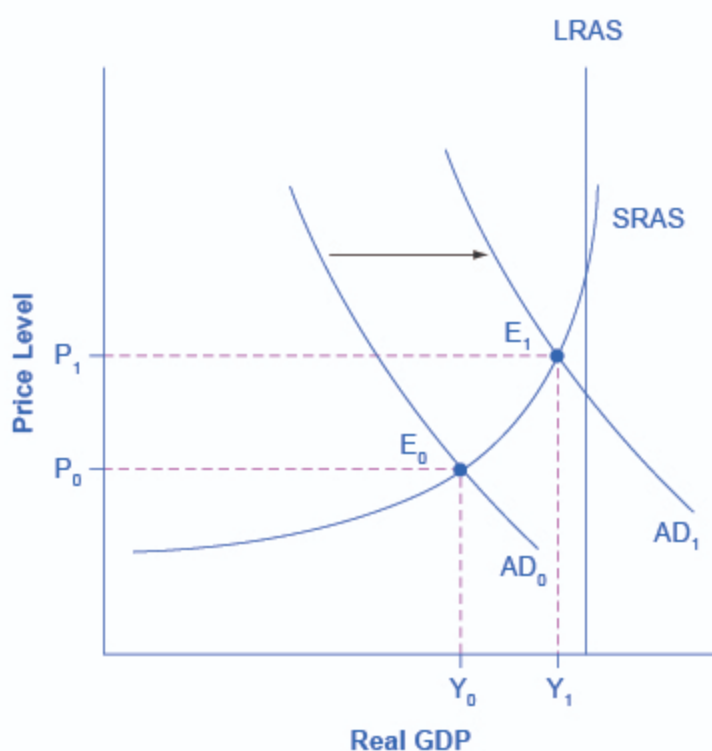
Government spending is one component of AD. Thus, higher government spending will cause AD to shift to the right, as in Figure 1 (a), while lower government spending will cause AD to shift to the left, as in Figure 2. For example, in South Africa, government consumption spending as a percentage of GDP was greater by 2.4 percentage points in 2012 than it was in 1994 (IDC: 2013). If changes of a few percentage points of GDP seem small to you, remember that since GDP was about R1.95 trillion in 2009, a seemingly small change of 2.4% of GDP is nearly R47 million.

Tax policy can affect consumption and investment spending, too. Tax cuts for individuals will tend to increase consumption demand, while tax increases will tend to diminish it. Tax policy can also pump up investment demand by offering lower tax rates for companies or tax reductions that benefit specific kinds of investment. Shifting C or I will shift the AD curve as a whole.

During a recession, when unemployment is high and many businesses are suffering low profits or even losses, the National Treasury and the South African Revenue Service (SARS) may implement tax cuts. During the 2016/2017 tax year, for example, the Minister of Finance decided against generalised income tax increases against the background of tough economic

conditions in South Africa (Munusamy and Merten, 2016). At such times, political considerations require a focus on how people going through hard times need relief from taxes. The aggregate supply and aggregate demand framework, however, offers a complementary rationale, as illustrated in Figure 2. The original equilibrium during a recession is at point E_0 , relatively far from the full employment level of output. The tax cut, by increasing consumption, shifts the AD curve to the right. At the new equilibrium (E_1), real GDP rises and unemployment falls and, because in this diagram the economy has not yet reached its potential or full employment level of GDP, any rise in the price level remains muted.

Recession and Full Employment in the AD/AS Model



Whether the economy is in a recession is illustrated in the AD/AS model by how close the equilibrium is to the potential GDP line as indicated by the vertical LRAS line. In this example, the level of output Y_0 at the equilibrium E_0 is relatively far from the potential GDP line, so it can represent an economy in recession, well

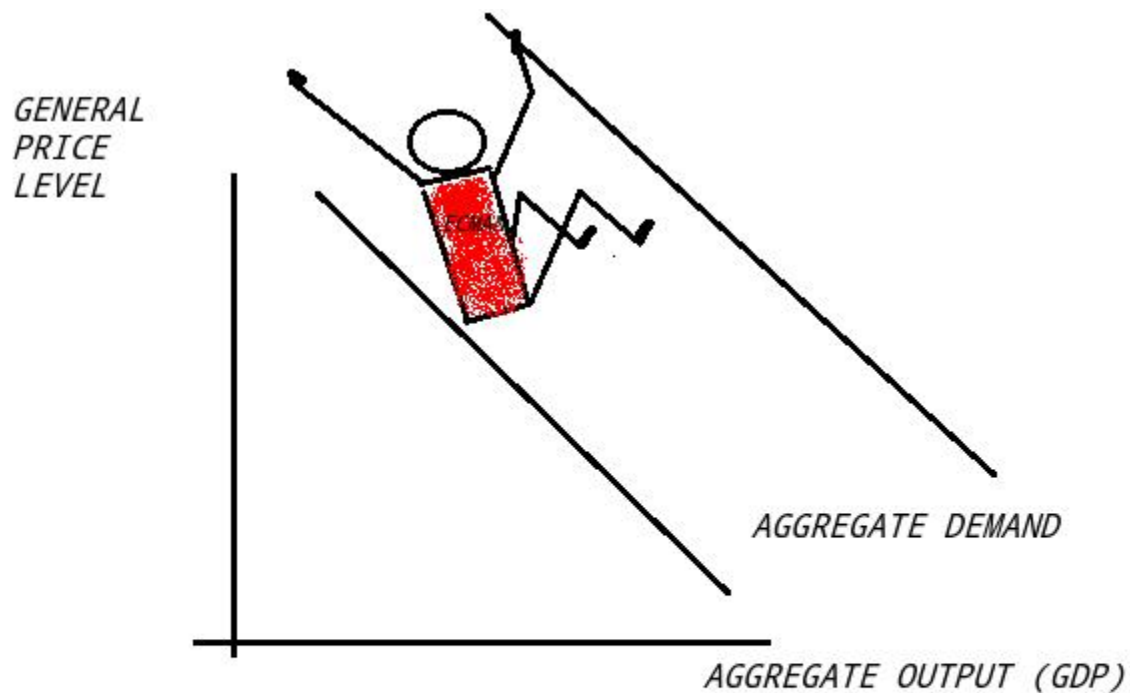
below the full employment level of GDP.

In contrast, the level of output Y_1 at the equilibrium E_1 is relatively close to potential GDP, and so it would represent an economy with a lower unemployment rate.

The use of government spending and tax cuts can be a useful tool to affect aggregate demand. Other policy tools can shift the aggregate demand curve as well. For example monetary policy and bank regulation by the South African Reserve Bank (SARB) can affect interest rates and the availability of credit. Higher interest rates tend to discourage borrowing and thus reduce both household spending on big-ticket items like houses and cars and investment spending by business. Conversely, lower interest rates will stimulate consumption and investment demand. Interest rates can also affect exchange rates, which in turn will have effects on the export and import components of aggregate demand.

Spelling out the details of these alternative policies and how they affect the components of aggregate demand can wait for the Keynesian Perspective chapter. Here, the key lesson is that a shift of the aggregate demand curve to the right leads to a greater real GDP and to upward pressure on the price level. Conversely, a shift of aggregate demand to the left leads to a lower real GDP and a lower price level. Whether these changes in output and price level are relatively large or relatively small, and how the change in equilibrium relates to potential GDP, depends on whether the shift in the AD curve is happening in the relatively flat or relatively steep portion of the AS curve.

Key Concepts and Summary



ALEX VD MERWE
05/08/2016

Figure 3

The AD curve will shift out as the components of aggregate demand—C, I, G, and X–M—rise. It will shift back to the left as these components fall. These factors can change because of different personal choices, like those resulting from consumer or business confidence, or from policy choices like changes in government spending and taxes. If the AD curve shifts to the right, then the equilibrium quantity of output and the price level will rise. If the AD curve shifts to the left, then the equilibrium quantity of output and the price level will fall. Whether equilibrium output changes relatively more than the price level or whether the price level changes relatively more than output is determined by where the AD curve intersects with the AS curve.

The AD/AS diagram appears to resemble the microeconomic supply and demand diagram on the surface, but in reality, what is on the horizontal and

vertical axes and the underlying economic reasons for the shapes of the curves are very different. Long-term economic growth is illustrated in the AD/AS framework by a gradual shift of the aggregate supply curve to the right. A recession is illustrated when the intersection of AD and AS is substantially below potential GDP, while an expanding economy is illustrated when the intersection of AS and AD is near potential GDP.

Self-Check Questions

Exercise:

Problem:

How would a large increase in the value of the stock market (Johannesburg Stock Exchange - JSE) shift the AD curve? What effect would the shift have on the equilibrium level of GDP and the price level?

Solution:

An increase in the value of the stock market would make individuals feel wealthier and thus more confident about their economic situation. This would likely cause an increase in consumer confidence leading to an increase in consumer spending, shifting the AD curve to the right. The result would be an increase in the equilibrium level of GDP and an increase in the price level.

Exercise:

Problem:

Suppose Britain, one of South Africa's largest trading partners and purchaser of a large quantity of our exports, goes into a recession as a result of its decision to leave the European Union. Use the AD/AS model to determine the likely impact on our equilibrium GDP and price level.

Solution:

Since imports depend on GDP, if Britain goes into recession, its GDP declines and so do its imports. This means a corresponding decline in South Africa's exports which can be shown as a leftward shift in AD, leading to a decrease in South Africa's GDP and price level.

Exercise:

Problem:

A policymaker claims that tax cuts led the economy out of a recession. Can we use the AD/AS diagram to show this?

Solution:

Tax cuts increase consumer and investment spending, depending on where the tax cuts are targeted. This would shift AD to the right, so if the tax cuts occurred when the economy was in recession (and GDP was less than potential), the tax cuts would increase GDP and “lead the economy out of recession.”

Exercise:

Problem:

Many financial analysts and economists eagerly await the press releases for the reports on the home price index and consumer confidence index. What would be the effects of a negative report on both of these? What about a positive report?

Solution:

A negative report on home prices would make consumers feel like the value of their homes, which for most South Africans is a major portion of their wealth, has declined. A negative report on consumer confidence would make consumers feel pessimistic about the future. Both of these would likely reduce consumer spending, shifting AD to the left, reducing GDP and the price level. A positive report on the home price index or consumer confidence would do the opposite.

Review Questions

Exercise:

Problem:

Name some factors that could cause AD to shift, and say whether they would shift AD to the right or to the left.

Exercise:

Problem:

Would a shift of AD to the right tend to make the equilibrium quantity and price level higher or lower? What about a shift of AD to the left?

Critical Thinking Questions

Exercise:

Problem:

If households decide to save a larger portion of their income, what effect would this have on the output, employment, and price level in the short run? What about the long run?

Exercise:

Problem:

If firms become more optimistic about the future of the economy and, at the same time, innovation in 3-D printing makes most workers more productive, what is the combined effect on output, employment, and the price-level?

Exercise:

Problem:

If SARS cuts taxes at the same time that businesses become more pessimistic about the economy, what is the combined effect on output, the price level, and employment using the AD/AS diagram?

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How the AD/AS Model Incorporates Growth, Unemployment, and Inflation
By the end of this section, you will be able to:

- Identify periods of economic growth and recession using the aggregate demand/aggregate supply model
- Explain how unemployment and inflation impact the aggregate demand/aggregate supply model
- Evaluate the importance of the aggregate demand/aggregate supply model

The Aggregate Demand/Aggregate Supply model can convey a number of interlocking relationships between the macroeconomic goals of **sustainable economic growth**, low unemployment, low inflation, and a sustainable **balance of trade**. Moreover, the AD/AS framework is flexible enough to accommodate both the Keynes' law approach that focuses on aggregate demand and the short run, while also including the Say's law approach that focuses on aggregate supply and the long run. These advantages are considerable. Every model is a simplified version of the deeper reality and, in the context of the AD/AS model, the macroeconomic goals are achieved in ways that are sometimes indirect or incomplete. In this module, we consider how the AD/AS model illustrates the three macroeconomic goals of promoting economic growth, reducing unemployment, and lowering inflation.

Growth and Recession in the AD/AS Diagram

In the AD/AS diagram, long-run economic growth due to productivity increases over time and will be represented by a gradual shift to the right of aggregate supply. The vertical line representing potential GDP (or the “full employment level of GDP”) and shown as LRAS in Figures 1 (a) and (b) below will gradually shift to the right over time as well illustrating this growth. However, the factors that determine the speed of this long-term economic growth rate—like investment in physical and human capital and technology do not appear directly in the AD/AS diagram.

In the short run, GDP falls and rises in every economy, as the economy dips into recession or expands out of recession. Recessions are illustrated in the

AD/AS diagram when the equilibrium level of real GDP is substantially below potential GDP, as is the case at the equilibrium point E_0 in Figure 1 (a). On the other hand, in years of good economic growth the equilibrium will typically be close to potential GDP (the LRAS).

Unemployment in the AD/AS Diagram

Various types of unemployment were described in the Unemployment chapter. Cyclical unemployment bounces up and down according to the short-run movements of real GDP. Over the long run, in South Africa, the official unemployment rate has unfortunately been stuck in the range of 17%-27% since at least 1994 (South Africa unemployment: 1994-2015: 2015). So even when the economy is relatively healthy, the lowest unemployment seems to get is 17%! In many of the national economies across Europe, the rate of unemployment in recent decades has only dropped to about 10% or a bit lower, even in good economic years. This baseline level of unemployment that occurs year-in and year-out is called the natural rate of unemployment and is determined by how well the structures of market and government institutions in the economy lead to a matching of workers and employers in the labor market. Potential GDP can imply different unemployment rates in different economies, depending on the natural rate of unemployment for that economy.

In the AD/AS diagram, cyclical unemployment is shown by how close the economy is to the potential or full employment level of GDP. Relatively low cyclical unemployment for an economy occurs when the level of output is close to potential GDP (LRAS). Conversely, high cyclical unemployment arises when the aggregate output is substantially to the left of potential GDP (LRAS) on the AD/AS diagram. The factors that determine the natural rate of unemployment are not shown separately in the AD/AS model, although they are implicitly part of what determines potential GDP or full employment GDP in a given economy.

Inflationary Pressures in the AD/AS Diagram

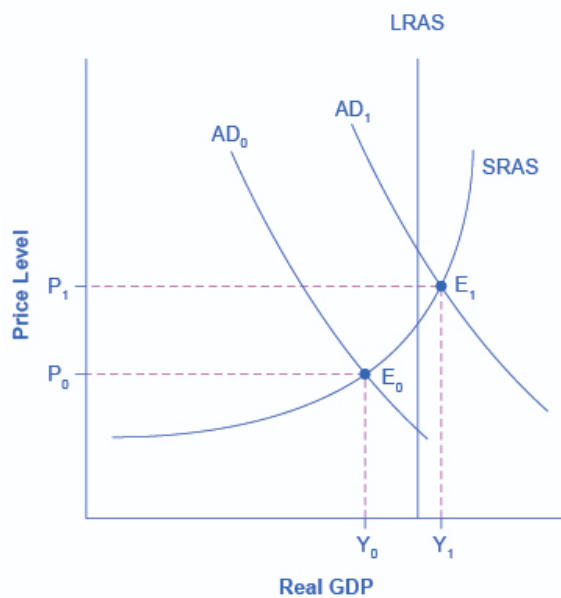
Inflation fluctuates in the short run. Higher inflation rates have typically occurred either during or just after economic recoveries or booms.

Conversely, rates of inflation generally decline during recessions. As an extreme example, inflation actually became negative—a situation called “deflation”—during the Great Depression in the 1930's. Following the deep recession of 2007–2009, the rate of inflation declined from 13.7% in August 2008 to 3.2% in September 2010 (Viljoen: 2016). Like many other countries, South Africa experienced bouts of high inflation that lasted for years. Between 1973 and 1992, for example, inflation in South Africa was consistently over 10% per year hitting a peak of nearly 21% in 1986 (Viljoen: 2016). Aren't you glad you were not around then! Since 2009, however, inflation in South Africa has averaged around 6% annually.

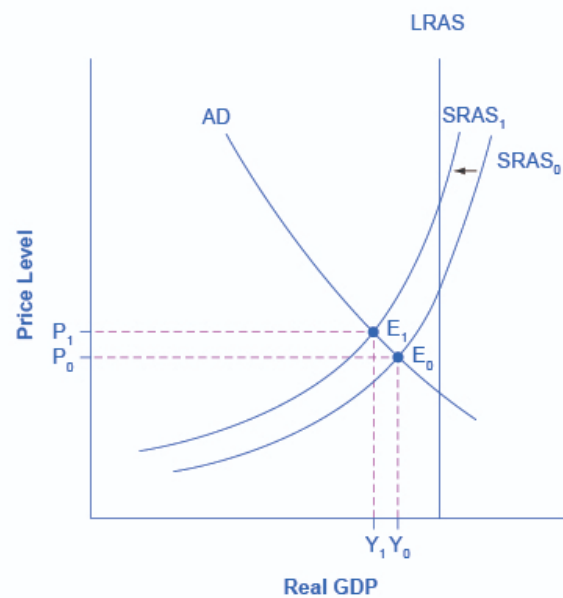
Demand inflation

The AD/AS framework implies two ways that inflationary pressures may arise. One possible trigger is if aggregate demand continues to shift to the right when the economy is already at or near potential GDP and full employment, thus pushing the macroeconomic equilibrium into the steep portion of the AS curve. In Figure 1 (a), there is a shift of aggregate demand to the right; the new equilibrium E_1 is clearly at a higher general price level than the original equilibrium E_0 . In this situation, the aggregate demand in the economy has soared so high that firms in the economy are not easily capable of producing additional goods, because labor and physical capital are fully employed, and so additional increases in aggregate demand can only result in a rise in the general price level. This type of inflation has been termed "demand-pull" inflation, that is, aggregate demand "pulls up" the general price level. Rising aggregate expenditure (C, I, G and X-M) at all price levels are the cause/s of increasing aggregate demand.

Sources of Inflationary Pressure in the AD/AS Model



(a) Inflationary pressure from a shift in AD



(b) Inflationary pressure from a shift in AS

(a) A shift in aggregate demand, from AD_0 to AD_1 , when it happens in the area of the SRAS curve that is near potential GDP, will lead to a higher price level and to pressure for a higher price level and inflation.

The new equilibrium (E_1) is at a higher price level (P_1) than the original equilibrium. (b) A shift in aggregate supply, from $SRAS_0$ to $SRAS_1$, will lead to a lower real GDP and to pressure for a higher price level and inflation. The new equilibrium (E_1) is at a higher price level (P_1), while the original equilibrium (E_0) is at the lower price level (P_0).

Cost inflation

An alternative source of inflationary pressures can occur due to a rise in input prices that affects many or most firms across the economy—perhaps an important input to production like oil or labor—and causes the aggregate supply curve to shift back to the left. In Figure 1 (b), the shift of the SRAS curve to the left also increases the price level from P_0 at the original equilibrium (E_0) to a higher price level of P_1 at the new equilibrium (E_1). In effect, the rise in input prices ends up, after the final output is produced and sold, being passed along in the form of a higher price level for outputs. This type of inflation has often been termed "cost-push" inflation or, as we learnt

in the inflation chapter, **stagflation**. Other sources of increased costs could include higher costs of imported inputs and exchange rate deterioration (also causing import costs to rise). Adverse events such as war or natural disasters (floods or drought) may also reduce the productive potential of the economy thus causing aggregate supply to shift left, resulting in higher inflation.

The AD/AS diagram shows only a one-time shift in the price level. It does not address the question of what would cause inflation either to vanish after a year, or to sustain itself for several years. There are two explanations for why inflation may persist over time. One way that continual inflationary price increases can occur is if the government continually attempts to stimulate aggregate demand in a way that keeps pushing the AD curve when it is already in the steep portion of the SRAS curve.

A second possibility is that, if inflation has been occurring for several years, a certain level of inflation may come to be expected. For example, if consumers, workers, and businesses all expect prices and wages to rise by a certain amount, then these expected rises in the price level can become built into the annual increases of prices, wages, and interest rates of the economy. This phenomenon has been termed the **wage-price spiral** in which demands for higher wages lead to a higher general price level which, in turn, feeds back into demands for higher wages. So, in other words, **expectations** of inflation result in actual inflation. These two reasons why inflation may persist over time are interrelated, because if a government fosters a macroeconomic environment with inflationary pressures, then people will grow to expect inflation. However, the AD/AS diagram does not show these patterns of ongoing or expected inflation in a direct way.

Importance of the Aggregate Demand/Aggregate Supply Model

Macroeconomics takes an overall view of the economy, which means that it needs to juggle many different concepts. For example, start with the macroeconomic goals of sustainable economic growth, low inflation, and low unemployment. Aggregate demand has four elements: consumption, investment, government spending, and exports less imports. Aggregate supply reveals how businesses throughout the economy will react to a

higher price level for outputs. Finally, a wide array of economic events and policy decisions can affect aggregate demand (either pull it back or push it out) and aggregate supply (either pull it back or push it out), including government tax and spending decisions; consumer and business confidence; changes in prices of key inputs like oil; and technology that brings higher levels of productivity.

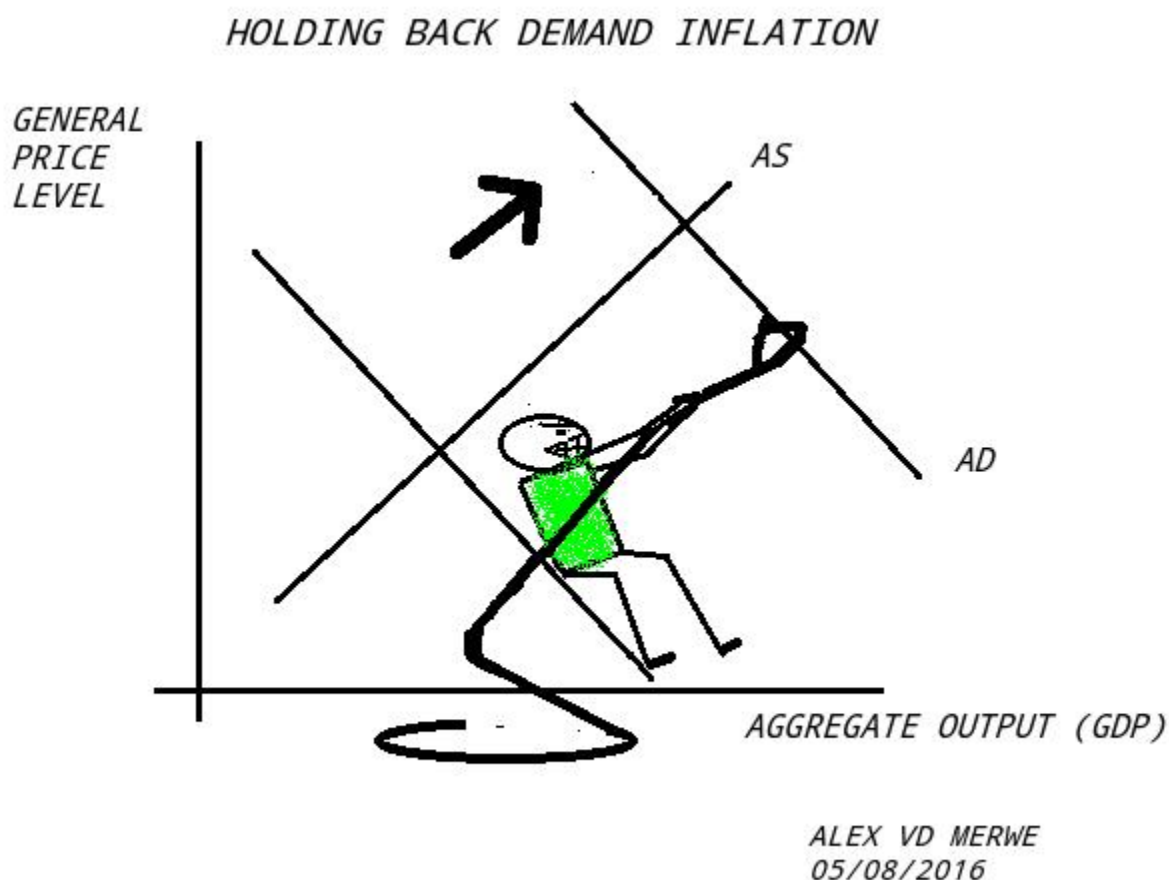
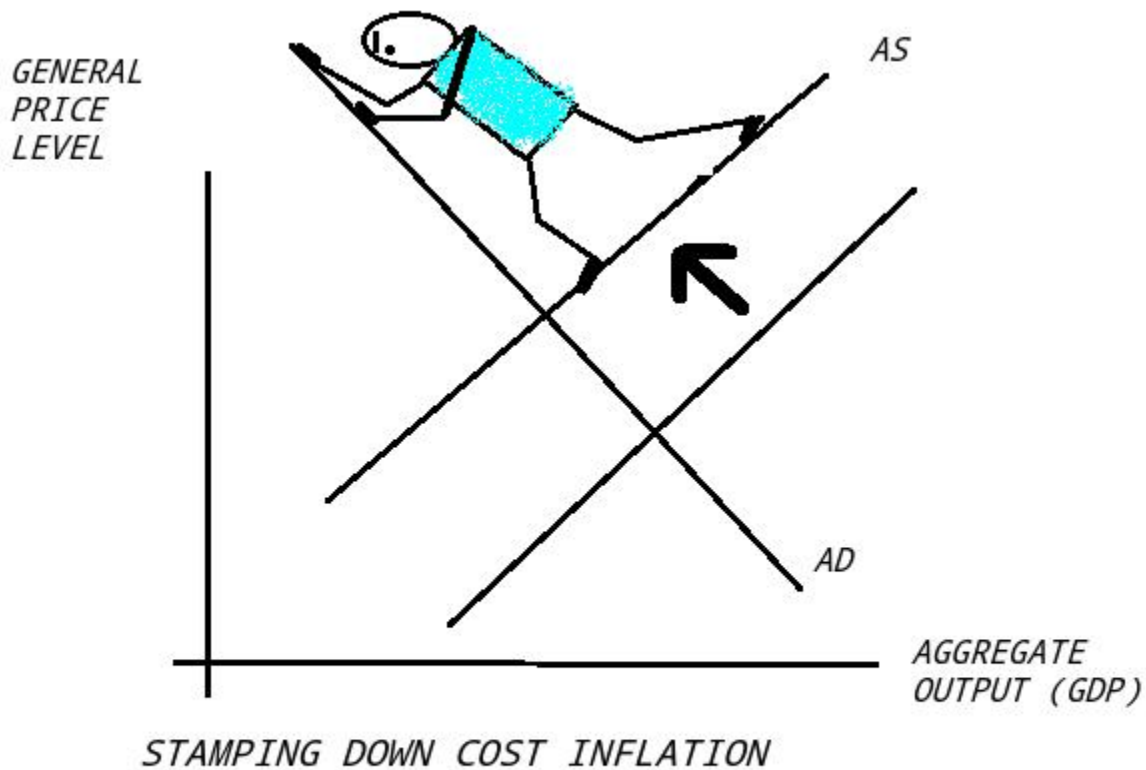


Figure 2

The aggregate demand/aggregate supply model is one of the fundamental diagrams in this book (like the budget constraint and supply and demand diagrams introduced earlier) because it provides an overall framework for

bringing these factors together in one diagram. Indeed, some version of the AD/AS model will appear in every chapter in the rest of this book.



ALEX VD MERWE
05/08/2016

Figure 3

Key Concepts and Summary

Cyclical unemployment is relatively large in the AD/AS framework when the equilibrium is substantially below potential GDP. Cyclical unemployment is small in the AD/AS framework when the equilibrium is near potential GDP. The natural rate of unemployment, as determined by the labor market institutions of the economy, is built into what is meant by potential GDP, but does not otherwise appear in an AD/AS diagram.

Pressures for inflation to rise or fall are shown in the AD/AS framework when the movement from one equilibrium to another causes the price level to rise or to fall. The balance of trade does not appear directly in the AD/AS diagram, but it appears indirectly in several ways. Increases in exports or declines in imports can cause shifts in AD. Changes in the price of key imported inputs to production, like oil, can cause shifts in AS. The AD/AS model is the key model used in this book to understand macroeconomic issues.

Self-Check Questions

Exercise:

Problem:

What impact would a decrease in the size of the labor force have on GDP and the price level according to the AD/AS model?

Solution:

A smaller labor force would be reflected in a leftward shift in AS, leading to a lower equilibrium level of GDP and higher price level.

Exercise:

Problem:

Suppose, after five years of sluggish growth, the economy of the European Union picks up speed. What would be the likely impact on the South African trade balance, GDP, and employment?

Solution:

Higher EU growth would increase demand for South African exports, reducing our trade deficit. The increased demand for exports would show up as a rightward shift in AD, causing GDP to rise (and the price level to rise as well). Higher GDP would require more jobs to fulfill, so South African employment would also rise.

Exercise:

Problem:

Suppose the South African Reserve Bank (SARB) begins to increase the supply of money at an increasing rate. What impact would that have on GDP, unemployment, and inflation?

Solution:

Expansionary monetary policy shifts AD to the right. A continuing expansionary policy would cause larger and larger shifts (given the parameters of this problem). The result would be an increase in GDP and employment (a decrease in unemployment) and higher prices until potential output was reached. After that point, the expansionary policy would simply cause inflation.

Review Questions**Exercise:**

Problem: How is long-term growth illustrated in an AD/AS model?

Exercise:

Problem: How is recession illustrated in an AD/AS model?

Exercise:**Problem:**

How is cyclical unemployment illustrated in an AD/AS model?

Exercise:**Problem:**

How is the natural rate of unemployment illustrated in an AD/AS model?

Exercise:

Problem:

How is pressure for inflationary price increases shown in an AD/AS model?

Exercise:

Problem:

What are some of the ways in which exports and imports can affect the AD/AS model?

Critical Thinking Questions

Exercise:

Problem:

Suppose the level of structural unemployment increases. How would the increase in structural unemployment be illustrated in the AD/AS model? *Hint:* How does structural unemployment affect potential GDP?

Exercise:

Problem:

If foreign wealth-holders decide that the United States is the safest place to invest their savings and NOT South Africa, what would the effect be on the South African? Show graphically using the AD/AS model.

Exercise:

Problem:

The AD/AS model is static. It shows a snapshot of the economy at a given point in time. Both economic growth and inflation are dynamic phenomena. Suppose economic growth is 3% per year and aggregate demand is growing at the same rate. What does the AD/AS model say the inflation rate should be?

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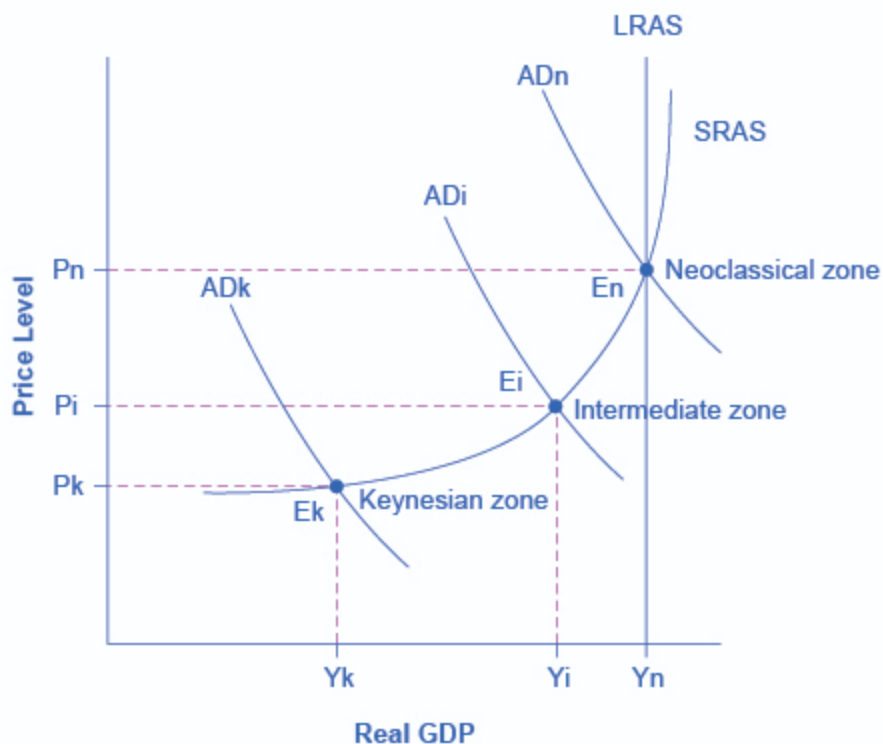
Keynes' Law and Say's Law in the AD/AS Model

By the end of this section, you will be able to:

- Identify the neoclassical zone, the intermediate zone, and the Keynesian zone in the aggregate demand/aggregate supply model
- Use an aggregate demand/aggregate supply model as a diagnostic test to understand the current state of the economy

The AD/AS model can be used to illustrate both Say's law that supply creates its own demand and Keynes' law that demand creates its own supply. Consider the three zones of the SRAS curve as identified in Figure 1: the Keynesian zone, the neoclassical zone, and the intermediate zone.

Keynes, Neoclassical, and Intermediate Zones in the Aggregate Supply Curve



Near the equilibrium E_k , in the Keynesian zone at the far left of the SRAS curve, small shifts in AD, either to the right or the left, will affect the output level Y_k , but will not much affect the price level.

In the Keynesian zone, AD largely determines the quantity of output. Near the equilibrium E_n , in the neoclassical zone at the far right of the SRAS curve, small shifts in AD, either to the right or

the left, will have relatively little effect on the output level Y_n , but instead will have a greater effect on the price level. In the neoclassical zone, the near-vertical SRAS curve close to the level of potential GDP largely determines the quantity of output. In the intermediate zone around equilibrium E_i , movement in AD to the right will increase both the output level and the price level, while a movement in AD to the left would decrease both the output level and the price level.

Focus first on the **Keynesian zone**, that portion of the SRAS (Short Run Aggregate Supply) curve on the far left which is relatively flat. If the AD curve crosses this portion of the SRAS curve at an equilibrium point like E_k , then certain statements about the economic situation will follow. In the Keynesian zone, the equilibrium level of real GDP is far below potential GDP (LRAS), the economy is in recession, and cyclical unemployment is high. If aggregate demand shifted to the right or left in the Keynesian zone, it will determine the resulting level of output (and thus unemployment). However, inflationary price pressure is not much of a worry in the Keynesian zone, since the price level does not vary much in this zone.

Now, focus your attention on the **neoclassical zone** of the SRAS curve, which is the near-vertical portion on the right-hand side. If the AD curve crosses this portion of the SRAS curve at an equilibrium point like E_n where output is at or near potential GDP, then the size of potential GDP pretty much determines the level of output in the economy. Since the equilibrium is near potential GDP, cyclical unemployment is low in this economy, although structural unemployment may remain an issue. In the neoclassical zone, shifts of aggregate demand to the right or the left have little effect on the level of output or employment. The only way to increase the size of the real GDP in the neoclassical zone is for AS to shift to the right. However, shifts in AD in the neoclassical zone will create pressures to change the price level.

Finally, consider the **intermediate zone** of the SRAS curve in Figure 1. If the AD curve crosses this portion of the SRAS curve at an equilibrium point

like E_i , then we might expect unemployment and inflation to move in opposing directions. For instance, a shift of AD to the right will move output closer to potential GDP and thus reduce unemployment, but will also lead to a higher price level and upward pressure on inflation. Conversely, a shift of AD to the left will move output further from potential GDP and raise unemployment, but will also lead to a lower price level and downward pressure on inflation.

The Phillips Curve

The often negative relationship between the unemployment rate and the inflation rate was first noted by New Zealand born British economist AW Phillips who observed that changes in the level of unemployment have a direct and predictable effect on the level of price inflation. It was understood in the 1960's when Phillips was doing his work that a fiscal stimulus, and increase in AD, would trigger the following sequence of responses: An increase in the demand for labour as spending generates growth, falling unemployment, rising wages as firms have to compete for workers with increased wage costs being passed on to consumers in higher prices (inflation).

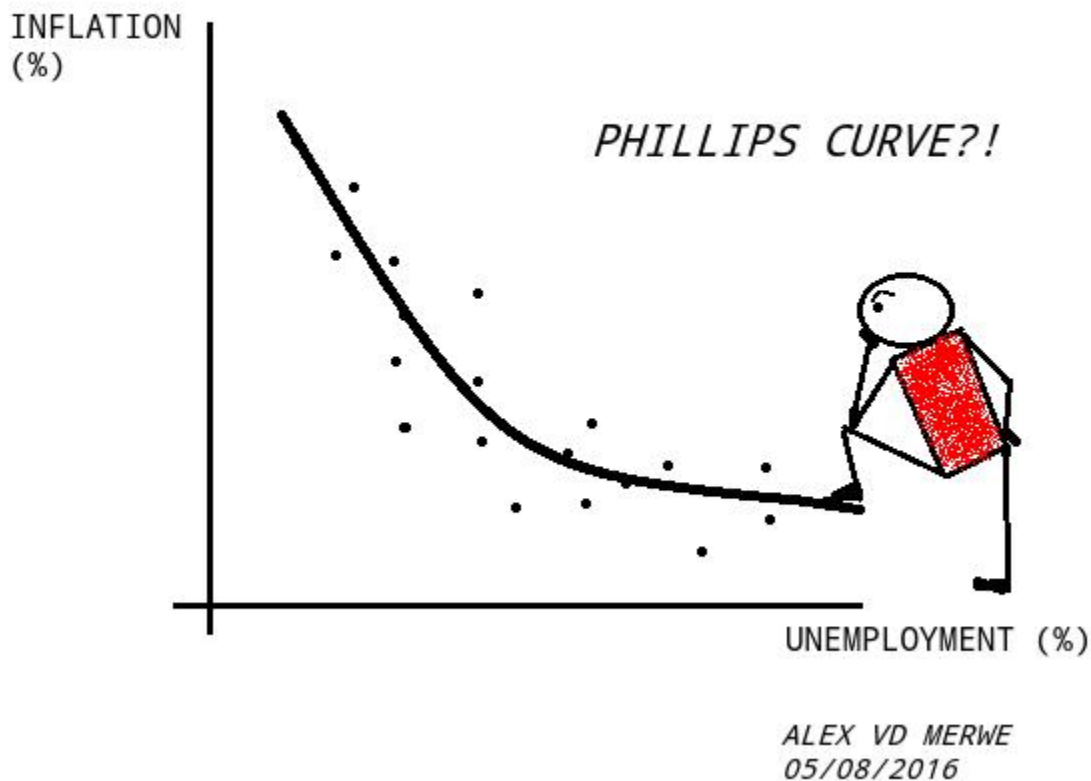


Figure 2: The Philips curve shows an inverse or negative relationship between the inflation rate and the unemployment rate.

The Phillips Curve theory was cheerfully seized by many governments and politicians as an opportunity to justify increased government spending supposedly to boost the economy and employment (perhaps more likely to keep voters happy!). Of course voters were expected to accept some level of increased inflation as the cost of such intervention by government. Today, however, it is recognised that the Phillips Curve relationship (suggested negative relationship between inflation and unemployment) does not always hold. For instance, in the case of stagflation (cost-push inflation), the inflation and unemployment rates move in the same direction (directly related).

This approach of dividing the SRAS curve into different zones works as a diagnostic test that can be applied to an economy, like a doctor checking a patient for symptoms. First, figure out what zone the economy is in and then the economic issues, tradeoffs, and policy choices will be clarified. Some economists believe that the economy is strongly likely to be in one zone or another. Thus, hard-line Keynesian economists believe that the economies are in the Keynesian zone most of the time, and so they view the neoclassical zone as just theory. Conversely, hard-line neoclassical economists argue that economies are in the neoclassical zone most of the time and that the Keynesian zone does not in fact exist.

Policy Considerations

While most economists agree on the usefulness of the AD/AS diagram in analyzing the sources of fluctuations in economic growth, employment and inflation, there is still some disagreement about the effectiveness of policy decisions that are useful in stabilizing these fluctuations.

Note:

From Housing Bubble to Housing Bust

Economic fluctuations, whether those experienced during the Great Depression of the 1930s, the stagflation of the 1970s, or the Great Recession of 2008–2009, can be explained using the AD/AS diagram. Short-run fluctuations in output occur due to shifts of the SRAS curve, the AD curve, or both. In the case of the United States housing bubble, rising home values caused the AD curve to shift to the right as more people felt that rising home values increased their overall wealth. Many homeowners took on mortgages that exceeded their ability to pay because, as home values continued to go up, the increased value would pay off any debt outstanding. Increased wealth due to rising home values lead to increased home equity loans and increased spending. All these activities pushed AD to the right, contributing to low unemployment rates and economic growth in the United States. When the housing bubble burst, overall wealth dropped dramatically, wiping out the recent gains. This drop in the value of homes was a demand shock to the United States economy because of its impact directly on the wealth of the household sector, and its contagion

into the financial sector that essentially locked up new credit. The AD curve shifted to the left as evidenced by the rising unemployment of the Great Recession.

Understanding the source of these macroeconomic fluctuations provided monetary and fiscal policy makers in the United States with insight about what policy actions to take to mitigate the impact of the housing crisis. From a monetary policy perspective, the Federal Reserve lowered short-term interest rates to between 0% and 0.25 %, to loosen up credit throughout the financial system. Discretionary fiscal policy measures included the passage of the Emergency Economic Stabilization Act of 2008 that allowed for the purchase of troubled assets, such as mortgages, from financial institutions and the American Recovery and Reinvestment Act of 2009 that increased government spending on infrastructure, provided for tax cuts, and increased transfer payments. In combination, both monetary and fiscal policy measures were designed to help stimulate aggregate demand in the U.S. economy, pushing the AD curve to the right.

Key Concepts and Summary

The SRAS curve can be divided into three zones. Keynes' law says demand creates its own supply, so that changes in aggregate demand cause changes in real GDP and employment. Keynes' law can be shown on the horizontal Keynesian zone of the aggregate supply curve. The Keynesian zone occurs at the left of the SRAS curve where it is fairly flat, so movements in AD will affect output, but have little effect on the price level. Say's law says supply creates its own demand. Changes in aggregate demand have no effect on real GDP and employment, only on the price level. Say's law can be shown on the vertical neoclassical zone of the aggregate supply curve. The neoclassical zone occurs at the right of the SRAS curve where it is fairly vertical, and so movements in AD will affect the price level, but have little impact on output. The intermediate zone in the middle of the SRAS curve is upward-sloping, so a rise in AD will cause higher output and price level, while a fall in AD will lead to a lower output and price level.

Self-Check Questions

Exercise:**Problem:**

If the economy is operating in the neoclassical zone of the SRAS curve and aggregate demand falls, what is likely to happen to real GDP?

Solution:

Since the SRAS curve is vertical in the neoclassical zone, unless the economy is bordering the intermediate zone, a decrease in AS will cause a decrease in the price level, but no effect on real economic activity (for example, real GDP or employment).

Exercise:**Problem:**

If the economy is operating in the Keynesian zone of the SRAS curve and aggregate demand falls, what is likely to happen to real GDP?

Solution:

Because the SRAS curve is horizontal in the Keynesian zone, a decrease in AD should depress real economic activity but have no effect on prices.

Review Questions**Exercise:****Problem:**

What is the Keynesian zone of the SRAS curve? How much is the price level likely to change in the Keynesian zone?

Exercise:

Problem:

What is the neoclassical zone of the SRAS curve? How much is the output level likely to change in the neoclassical zone?

Exercise:**Problem:**

What is the intermediate zone of the SRAS curve? Will a rise in output be accompanied by a rise or a fall in the price level in this zone?

Critical Thinking Questions**Exercise:****Problem:**

Explain why the short-run aggregate supply curve might be fairly flat in the Keynesian zone of the SRAS curve. How might we tell if we are in the Keynesian zone of the AS?

Exercise:**Problem:**

Explain why the short-run aggregate supply curve might be vertical in the neoclassical zone of the SRAS curve. How might we tell if we are in the neoclassical zone of the AS?

Exercise:**Problem:**

Why might it be important for policymakers to know which zone of the SRAS curve the economy is in?

Exercise:

Problem:

In your view, is the economy currently operating in the Keynesian, intermediate or neoclassical portion of the economy's aggregate supply curve?

Exercise:**Problem:**

Are Say's law and Keynes' law necessarily mutually exclusive?

Glossary**intermediate zone**

portion of the SRAS curve where GDP is below potential but not so far below as in the Keynesian zone; the SRAS curve is upward-sloping, but not vertical in the intermediate zone

Keynesian zone

portion of the SRAS curve where GDP is far below potential and the SRAS curve is flat

neoclassical zone

portion of the SRAS curve where GDP is at or near potential output where the SRAS curve is steep

The Expenditure-Output Model

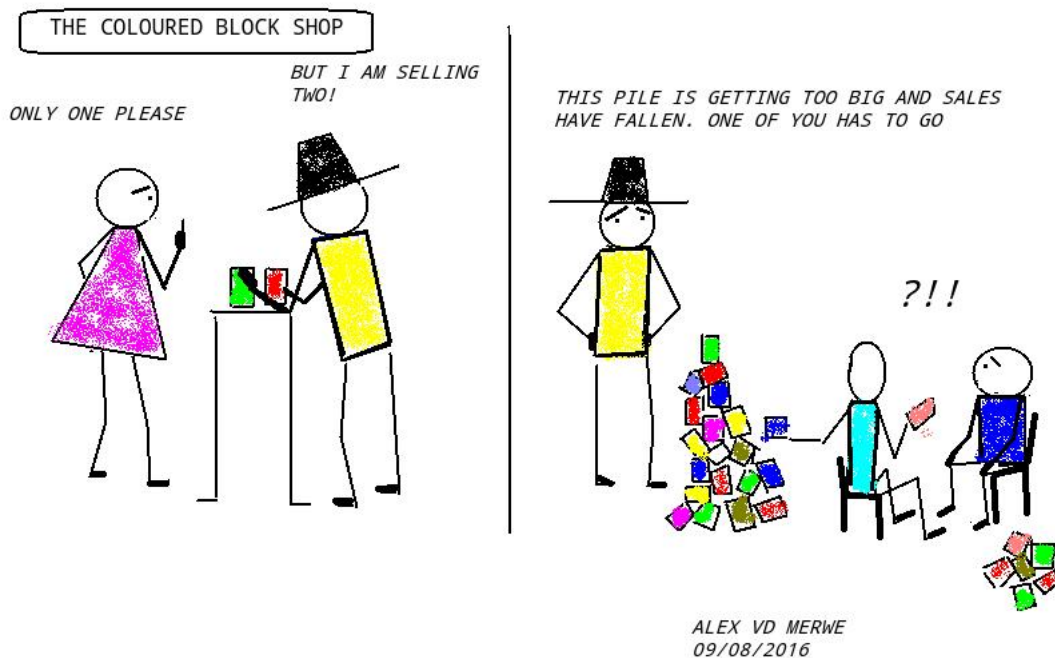


Figure A. Keynes's message in a nut-shell (or rather, in the coloured block shop!)

(This chapter should be consulted after first familiarising yourself with both the the Aggregate Demand/Aggregate Supply Model and the Keynesian Perspective. The fundamental ideas of Keynesian economics were developed before the AD/AS model was popularized. From the 1930s until the 1970s, Keynesian economics was usually explained with a different model, known as the expenditure-output approach. This approach is strongly rooted in the fundamental assumptions of Keynesian economics: it focuses on the total amount of spending in the economy, with no explicit mention of aggregate supply or of the price level (although as you will see, it is possible to draw some inferences about aggregate supply and price levels based on the diagram). The Keynesian logic in the Expenditure/Output Model remains the same as in the Keynesian perspective using the Aggregate Demand/Aggregate Supply model: that planned aggregate expenditure may not match planned aggregate output with consequences for economic growth, employment and inflation.

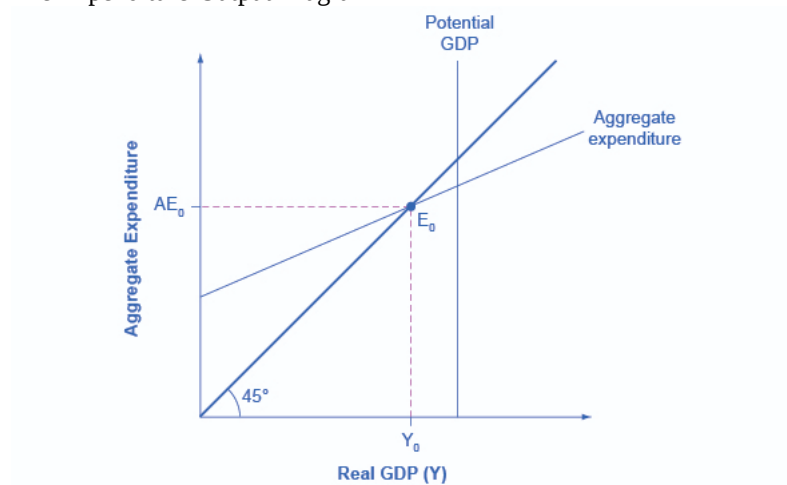
Assumptions of the Keynesian Expenditure-Output Model

This model, because it focuses only on the relationship between aggregate expenditure and aggregate output, cannot account for other economic variables such as inflation (or wages and other labor market developments that might fuel inflation). Similarly, the amount (stock) of money and interest rates prevailing in the economy are decided outside the model which means it cannot be used to study financial markets or monetary policy. The model is also based on the Keynesian assumption that spending (aggregate demand) is the engine of economic activity and that production responds to changes in spending (contrary to Say's Law). The **simple** version of Keynes's Expenditure/Output Model excludes government spending as well as the foreign sector. It considers only the effects of households' and firms' spending on aggregate output.

The Axes of the Expenditure-Output Diagram

The expenditure-output model, sometimes also called the Keynesian cross diagram, determines the equilibrium level of real GDP by the point where the total or aggregate expenditures in the economy are equal to the amount of output produced. The axes of the Keynesian cross diagram presented in Figure 1 show real GDP on the horizontal axis as a measure of output and aggregate expenditures on the vertical axis as a measure of spending.

The Expenditure-Output Diagram



The aggregate expenditure-output model shows aggregate expenditures on the vertical axis and real GDP on the horizontal axis. A vertical line shows potential GDP where full employment occurs. The 45-degree line shows all points where aggregate expenditures and output are equal. The aggregate expenditure schedule shows how total spending or aggregate expenditure increases as output or real GDP rises. The intersection of the aggregate expenditure schedule and the 45-degree line will be the equilibrium. Equilibrium occurs at E_0 , where aggregate expenditure AE_0 is equal to the output level Y_0 .

Remember that GDP can be thought of in several equivalent ways: it measures both the value of spending on final goods and also the value of the production of final goods. All sales of the final goods and services that make up GDP will eventually end up as income for workers, for managers, and for investors and owners of firms. The sum of all the income received for contributing resources to GDP is called national income (Y). At some points in the discussion that follows, it will be useful to refer to real GDP as “national income.” Both axes are measured in real (inflation-adjusted) terms.

The Potential GDP Line and the 45-degree Line

The Keynesian cross diagram contains two lines that serve as reference points to guide the discussion. The first is a vertical line showing the level of potential GDP which in the Aggregate Demand/Aggregate Supply Model would be referred to as the Long Run Aggregate Supply (LRAS). So potential GDP means the same thing here that it means in the AD/AS diagrams: it refers to the quantity of output that the economy can produce with full employment of its labor and physical capital.

The second conceptual line on the Keynesian cross diagram is the 45-degree line, which starts at the origin and reaches up and to the right. A line that stretches up at a 45-degree angle represents the set of points (1, 1), (2, 2), (3, 3) and so on, where the measurement on the vertical axis is equal to the measurement on the horizontal axis. In this diagram, the 45-degree line shows the set of points where the level of aggregate expenditure in the economy, measured on the vertical axis, is equal to the level of output or national income in the economy, measured by GDP on the horizontal axis.

When the macroeconomy is in equilibrium, it must be true that the aggregate expenditures in the economy are equal to the real GDP—because by definition, GDP is the measure of what is spent on final sales of goods and services in the economy. Thus, the equilibrium calculated with a Keynesian cross diagram will always end up where aggregate expenditure and output are equal—which will only occur along the 45-degree line.

The Aggregate Expenditure Schedule

The final ingredient of the Keynesian cross or expenditure-output diagram is the aggregate expenditure schedule, which will show the total expenditures in the economy for each level of real GDP. The intersection of the aggregate expenditure line with the 45-degree line—at point E_0 in Figure 1 — will show the equilibrium for the economy, because it is the point where aggregate expenditure is equal to output or real GDP. After developing an understanding of what the aggregate expenditures schedule means, we will return to this equilibrium and how to interpret it.

Building the Aggregate Expenditure Schedule

Aggregate expenditure is the key to the expenditure-income model. The aggregate expenditure schedule shows, either in the form of a table or a graph, how aggregate expenditures in the economy rise as real GDP or national income rises. Thus, in thinking about the components of the aggregate expenditure line—consumption, investment, government spending, exports and imports—the key question is how expenditures in each category will adjust as national income rises.

Consumption Spending as a Function of National Income

How do consumption expenditures increase as national income rises? People can do two things with their income: consume it or save it (for the moment, let's ignore the need to pay taxes with some of it). Each person who receives an additional Rand faces this choice. The marginal propensity to consume (MPC), is the share of the additional Rand of income a person decides to devote to consumption expenditures. The marginal propensity to save (MPS) is the share of the additional Rand a person decides to save. It must always hold true that the percent of any Rand spent and the remaining percent of it that is saved must add up to 100%:

Equation:

$$\text{MPC (c)} = \text{Change in Consumption Spending} / \text{Change in Income (Y)}$$

Equation:

$$\text{MPS (s)} = \text{Change in Savings} / \text{Change in Income (Y)}$$

Equation:

$$\text{MPC} + \text{MPS} = 1$$

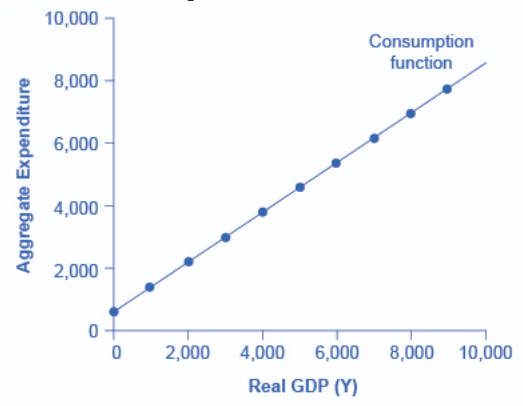
With this relationship in mind, consider the relationship among income, consumption, and savings shown in Figure 2. (Note that we use “Aggregate Expenditure” on the vertical axis in this and the following figures, because all consumption expenditures are parts of aggregate expenditures.)

Expenditure and Output in the Imaginary Country of Xurbia

An assumption commonly made in this model is that even if income were zero, people would have to consume something (this is termed **autonomous** consumption spending). In our imaginary country which uses Xurbian Dollars, consumption would be \$600 even if income were zero. In this example the Marginal Propensity to Consume - MPC is 0.8 and the Marginal Propensity to Save - MPS is 0.2. Thus, when income increases by \$1,000, consumption rises by \$800 and savings rises by \$200. At an income of \$4,000, total consumption will be the \$600 that would be consumed even without any income, plus \$4,000 multiplied by the marginal propensity to consume of 0.8, or \$3,200, for a total of \$3,800. The total amount of consumption and saving must always add up to the total amount of income. (Exactly how a situation of zero income and negative savings would work in practice is not important, because even low-income societies are not literally at zero income, so the point is hypothetical.)

This relationship between income and consumption, illustrated in Figure 1 and Table 1, is called the consumption function.

Xurbia's Consumption Function



In the expenditure-output model, how does consumption increase with the level of national income? Output on the horizontal axis is conceptually the same as national income, since the value of all final output that is produced and sold must be income to someone, somewhere in the economy. At a national income level of zero, \$600 is consumed. Then, each time income rises by \$1,000, consumption rises by \$800, because in this example, the marginal propensity to consume is 0.8.

The pattern of consumption shown in Table 1 is plotted in Figure 2. To calculate consumption, multiply the income level by 0.8, for the marginal propensity to consume, and add \$600, for the amount that would be consumed even if income was zero. Consumption plus savings must be equal to income.

Income	Consumption	Savings
\$0	\$600	-\$600
\$1,000	\$1,400	-\$400
\$2,000	\$2,200	-\$200
\$3,000	\$3,000	\$0
\$4,000	\$3,800	\$200
\$5,000	\$4,600	\$400

Income	Consumption	Savings
\$6,000	\$5,400	\$600
\$7,000	\$6,200	\$800
\$8,000	\$7,000	\$1,000
\$9,000	\$7,800	\$1,200

The Consumption Function

So the general pattern we observe is that, as income increases, so does consumption spending (with the exception of autonomous consumption). The part of spending that increases as income increases is referred to as **induced** spending. However, a number of factors other than income (that is, non income determinants of consumption spending) can also cause the entire consumption function to shift.

Non Income Determinants of Consumption Spending Revisited

These factors were discussed in detail in the Aggregate Demand/Aggregate Supply Model and are only summarised here. First, consumption spending at all possible income levels could rise because of a fall in **interest rates** so that higher levels of borrowing fuel more spending at all possible income levels. The entire consumption function (graph) would shift upwards in a parallel move (We will illustrate this later in this chapter). In the Aggregate Demand/Aggregate supply model the same effect would be shown by a rightward shift of the Aggregate Demand curve. Alternatively, interest rates could rise causing borrowing to fall and thus spending at all income levels to fall. This would be illustrated by a parallel shift downwards of the consumption function. If we were working with the Aggregate Demand/Aggregate supply model, the same effect would be shown by a shift left of the Aggregate Demand curve.

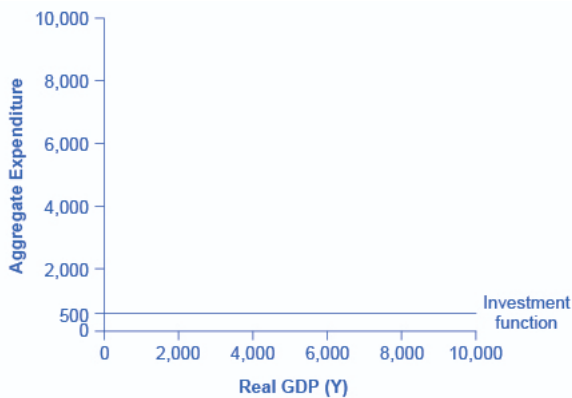
Other non-income determinants of consumption spending include peoples' **expectations**. So if, for example, consumers feel pessimistic about economic conditions (such as fear of retrenchment, say), spending may fall at all possible income levels and the consumption function will shift down/fall. Alternatively, if consumers expect inflation to rise in future (as another example of an expectation that may influence spending), spending right now may increase, that is, before inflation rises. The consumption function will shift up. Consumers' **wealth**, as opposed to income will also influence spending at all income levels. Thus, for example, if the value of their shares on the JSE increases, this will make consumers feel more wealthy and their spending at all possible income levels will increase. The consumption function will shift upwards.

The **income distribution** in a country is also likely to influence consumption spending. Lower income households tend to spend a greater proportion of their income than do high income households. Similarly, a country whose population is made up of a high proportion of youth who are of school going age, will have lower level of consumption spending at all income levels than a country that has a high labor force participation and employment rates. Higher **taxes** will reduce consumption spending at all possible income levels and lower tax levels will shift consumption spending up.

Investment Spending as a Function of National Income

Investment decisions are forward-looking, based on expected rates of return. Precisely because investment decisions depend primarily on perceptions about future economic conditions, they do *not* depend primarily on the level of GDP (aggregate output/income, Y) in the current year. Thus, on a Keynesian cross diagram, the investment function can be drawn as a horizontal line, at a fixed level of expenditure (that is, Investment spending is independent of income). Figure 3 shows an investment function where the level of investment is, for the sake of concreteness, set at the specific level of \$500 in our imaginary country of Xurbia. Just as the consumption function shows the relationship between consumption levels and real GDP (aggregate output/income, Y), the investment function shows the relationship between investment levels and real GDP (aggregate output/income, Y). In the Keynesian Expenditure-Output Model, Investment spending is treated as **autonomous**, that is, not dependent on income.

The Investment Function



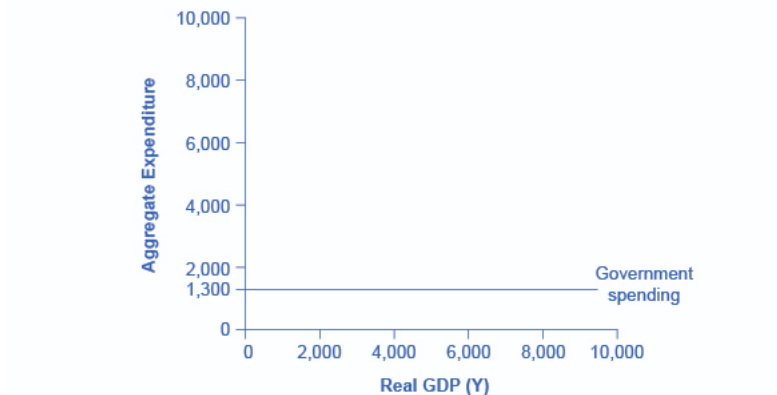
The investment function is drawn as a flat line because investment is based on interest rates and expectations about the future, and so it does not change with the level of current national income. In this example, investment expenditures are at a level of 500. However, changes in factors like technological opportunities, expectations about near-term economic growth, and interest rates would all cause the investment function to shift up or down.

The appearance of the investment function as a horizontal line does not mean that the level of investment never moves. It means only that in the context of this two-dimensional diagram, the level of investment on the vertical aggregate expenditure axis does not vary according to the current level of real GDP (aggregate output/income, Y) on the horizontal axis. However, all the other factors that vary investment—new technological opportunities, expectations about near-term economic growth, interest rates, the price of key inputs, and tax incentives for investment—can cause the horizontal investment function to shift up or down indicating increases or decreases in autonomous investment spending.

Government Spending and Taxes as a Function of National Income

In the Keynesian cross diagram, government spending also appears as a horizontal line, as in Figure 4, where government spending is set at a level of \$1,300 in our imaginary country of Xurbia. As in the case of investment spending, this horizontal line does not mean that government spending is unchanging. It means only that government spending changes when the National Treasury decides on a change in the budget, rather than shifting in a predictable way with the current size of the real GDP (aggregate output/income, Y) shown on the horizontal axis. So, like investment spending, government spending is also treated as **autonomous** in the Keynesian Expenditure-Output Model, that is, it is independent of real aggregate output/income and depends more on political considerations and the goals of government. Bigger national budgets will shift the government spending function up and smaller budgets, conversely, will shift it down.

The Government Spending Function

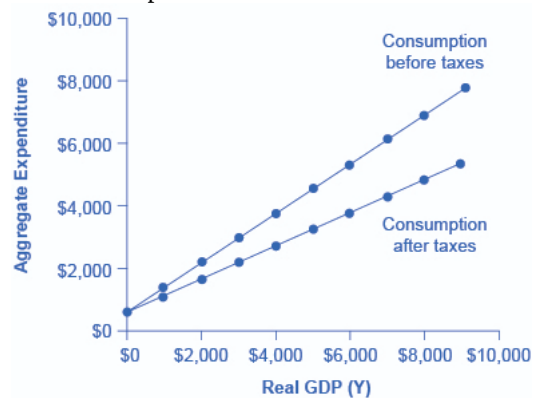


The level of government spending is determined by political factors, not by the level of real GDP in a given year. Thus, government spending is drawn as a horizontal line. In this example, government spending is at a level of 1,300. Decisions to increase government spending will cause this horizontal line to shift up, while decisions to reduce spending would cause it to shift down.

The situation of taxes is different because taxes often rise or fall with the volume of economic activity. For example, income taxes are based on the level of income earned and value added tax (VAT) is based on the amount of sales made, and both income and VAT tend to be higher when the economy is growing and lower when the economy is in a recession. For the purposes of constructing the basic Keynesian cross diagram, it is helpful to view taxes as a proportionate share of GDP. In 2012, tax revenue as a percent of GDP in South Africa, for example, was 26.5% (Tax revenue (% GDP) in South Africa: 2012).

Table 2 revises the earlier table on the consumption function so that it takes taxes in Xurbia into account. The first column shows aggregate income. The second column calculates taxes, which in this example are set at a rate of 30%, or 0.3. The third column shows after-tax (disposable) income; that is, total income minus taxes. The fourth column then calculates consumption in the same manner as before: multiply after-tax income by 0.8, representing the marginal propensity to consume, and then add \$600, for the amount that would be consumed even if income was zero (autonomous consumption). When taxes are included, the marginal propensity to consume is reduced by the amount of the tax rate, so each additional Xurbian dollar of income results in a smaller increase in consumption than before taxes. For this reason, the consumption function, with taxes included, is flatter than the consumption function without taxes, as Figure 5 shows.

The Consumption Function Before and After Taxes



The upper line repeats the consumption function from [\[link\]](#). The lower line shows

the consumption function if taxes must first be paid on income, and then consumption is based on after-tax income.

Income	Taxes	After-Tax Income	Consumption	Savings
\$0	\$0	\$0	\$600	−\$600
\$1,000	\$300	\$700	\$1,160	−\$460
\$2,000	\$600	\$1,400	\$1,720	−\$320
\$3,000	\$900	\$2,100	\$2,280	−\$180
\$4,000	\$1,200	\$2,800	\$2,840	−\$40
\$5,000	\$1,500	\$3,500	\$3,400	\$100
\$6,000	\$1,800	\$4,200	\$3,960	\$240
\$7,000	\$2,100	\$4,900	\$4,520	\$380
\$8,000	\$2,400	\$5,600	\$5,080	\$520
\$9,000	\$2,700	\$6,300	\$5,640	\$660

The Consumption Function Before and After Taxes

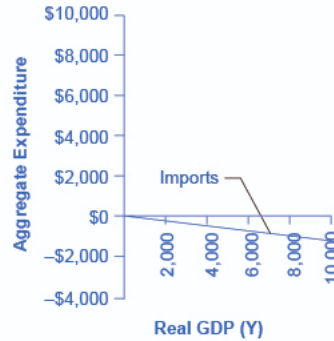
Exports and Imports as a Function of National Income

The export function, which shows how exports change with the level of a country's own real GDP, is drawn as a horizontal line, as in the example in Figure 6 (a) where exports are drawn at a level of \$840. Again, as in the case of investment spending and government spending, drawing the export function as horizontal does not imply that exports never change. It just means that they do not change because of what is on the horizontal axis—that is, a country's own level of domestic production/income—and instead are shaped by the level of aggregate demand in other countries. More demand for exports from other countries would cause the export function to shift up; less demand for exports from other countries would cause it to shift down. So, like investment and government spending, export spending in the Keynesian Expenditure-Output Model is treated as autonomous, that is, it does not depend on the country's real aggregate output/income (Y).

The Export and Import Functions



(a) The export function



(b) The import function

(a) The export function is drawn as a horizontal line because exports are determined by the buying power of other countries and thus do not change with the size of the domestic economy. In this example, exports are set at \$840. However, exports can shift up or down, depending on buying patterns in other countries. (b) The import function is drawn in negative territory because expenditures on imported products are a subtraction from expenditures in the domestic economy. In this example, the marginal propensity to import is 0.1, so imports are calculated by multiplying the level of income by -0.1 .

Imports are drawn in the Keynesian cross diagram as a downward-sloping line, with the downward slope determined by the marginal propensity to import (MPI), out of national income. In Figure 6 (b), the marginal propensity to import is 0.1. Thus, if real GDP is \$5,000, imports are \$500; if national income is \$6,000, imports are \$600, and so on. The import function is drawn as downward sloping and negative, because it represents a subtraction from the aggregate expenditures in the domestic economy. A change in the marginal propensity to import, perhaps as a result of changes in preferences, would alter the slope of the import function.

Equation:

$$\text{MPI (i)} = \text{Change in Import Spending} / \text{Change in Income (Y)}$$

Note:

Using an Algebraic Approach to the Expenditure-Output Model

In the expenditure-output or Keynesian cross model, the equilibrium (between aggregate spending and aggregate output/income occurs where the aggregate expenditure line (AE line) crosses the 45-degree line. Given algebraic equations for two lines, the point where they cross can be readily calculated. Let's take the imaginary Island of Atlam which uses the Atlamese Dollar as its monetary unit. It has the following characteristics.

Y = Real GDP or aggregate income

T = Taxes = $0.3Y$

C = Consumption = $140 + 0.9(Y - T)$

I = Investment = 400

G = Government spending = 800

X = Exports = 600

M = Imports = $0.15Y$

Step 1. Determine the aggregate expenditure function. In this case, it is:

Equation:

$$AE = C + I + G + X - M$$

$$AE = 140 + 0.9(Y - T) + 400 + 800 + 600 - 0.15Y$$

Step 2. The equation for the 45-degree line is the set of points where GDP or national income on the horizontal axis is equal to aggregate expenditure on the vertical axis. Thus, the equation for the 45-degree line is: $AE = Y$.

Step 3. The next step is to solve these two equations for Y (or AE , since they will be equal to each other).

Substitute Y for AE :

Equation:

$$Y = 140 + 0.9(Y - T) + 400 + 800 + 600 - 0.15Y$$

Step 4. Insert the term $0.3Y$ for the tax rate T . This produces an equation with only one variable, Y .

Step 5. Work through the algebra and solve for Y .

Equation:

$$Y = 140 + 0.9(Y - 0.3Y) + 400 + 800 + 600 - 0.15Y$$

$$Y = 140 + 0.9Y - 0.27Y + 1800 - 0.15Y$$

$$Y = 1940 + 0.48Y$$

$$Y - 0.48Y = 1940$$

$$0.52Y = 1940$$

$$\frac{0.52Y}{0.52} = \frac{1940}{0.52}$$

$$Y = 3730$$

This algebraic framework is flexible and useful in predicting how economic events and policy actions will affect real GDP.

Step 6. Say, for example, that because of changes in the relative prices of domestic and foreign goods, the marginal propensity to import falls to 0.1. Calculate the equilibrium output when the marginal propensity to import is changed to 0.1.

Equation:

$$Y = 140 + 0.9(Y - 0.3Y) + 400 + 800 + 600 - 0.1Y$$

$$Y = 1940 - 0.53Y$$

$$0.47Y = 1940$$

$$Y = 4127$$

Step 7. Because of a surge of business confidence, investment rises to 500 (assume the original $MPI = 0.15$). Calculate the equilibrium output.

Equation:

$$Y = 140 + 0.9(Y - 0.3Y) + 500 + 800 + 600 - 0.15Y$$

$$Y = 2040 + 0.48Y$$

$$Y - 0.48Y = 2040$$

$$0.52Y = 2040$$

$$Y = 3923$$

For issues of policy, the key questions would be how to adjust government spending levels or tax rates so that the full employment level of equilibrium output/income can be realised. In this case, let the economic parameters be:

Y = National income

T = Taxes = $0.3Y$

C = Consumption = $200 + 0.9(Y - T)$

I = Investment = 600

G = Government spending = 1,000

X = Exports = 600

Y = Imports = $0.1(Y)$

Step 8. Calculate the equilibrium for this economy (remember $Y = AE$).

Equation:

$$\begin{aligned}
 Y &= 200 + 0.9(Y - 0.3Y) + 600 + 1000 + 600 - 0.1(Y) \\
 Y - 0.63Y + 0.1Y &= 2400 \\
 0.47Y &= 2400 \\
 Y &= 5106
 \end{aligned}$$

Step 9. Assume that the full employment level of output is \$6,000. What level of government spending would be necessary to reach that level? To answer this question, plug in 6,000 as equal to Y, but leave G as a variable, and solve for G. Thus:

Equation:

$$6000 = 200 + 0.9(6000 - 0.3(6000)) + 600 + G + 600 - 0.1(6000)$$

Step 10. Solve this problem arithmetically. The answer is: $G = \$1,420$. In other words, increasing government spending by \$420, from its original level of \$1,000, to \$1,420, would raise output to the full employment level of GDP.

Indeed, the question of how much to increase government spending so that equilibrium output will rise from \$5,106 to 6,000 can be answered without working through the algebra, just by using the full multiplier formula (see the section on the multiplier effect below). The multiplier equation in this case is:

Equation:

$$\text{Spending Multiplier} = 1 / (1 - \text{MPC} * (1 - \text{tax rate}) + \text{MPI})$$

Equation:

$$\text{Spending Multiplier} = 1 / (1 - 0.9 * (1 - 0.3) + 0.1)$$

Equation:

$$\frac{1}{0.47} = 2.13$$

Thus, to raise output by $\$6000 - \$5106 = \$894$ would require an increase in government spending of $\$894 / 2.13 = \420 (rounded to the nearest Xurbian Dollar), which is the same as the answer derived from the algebraic calculation (see Step 10).

This algebraic framework is highly flexible. For example, taxes can be treated as a total set by political considerations (like government spending) and not dependent on national income. Imports might be based on before-tax income, not after-tax income as in the example of Xurbia. For certain purposes, it may be helpful to analyze the economy without exports and imports. A more complicated approach could divide up consumption, investment, government, exports and imports into smaller categories, or to build in some variability in the rates of taxes, savings, and imports. A wise economist will shape the model to fit the specific question under investigation.

Building the Combined Aggregate Expenditure Function

The Simple Keynesian Expenditure-Output Model (C + I)

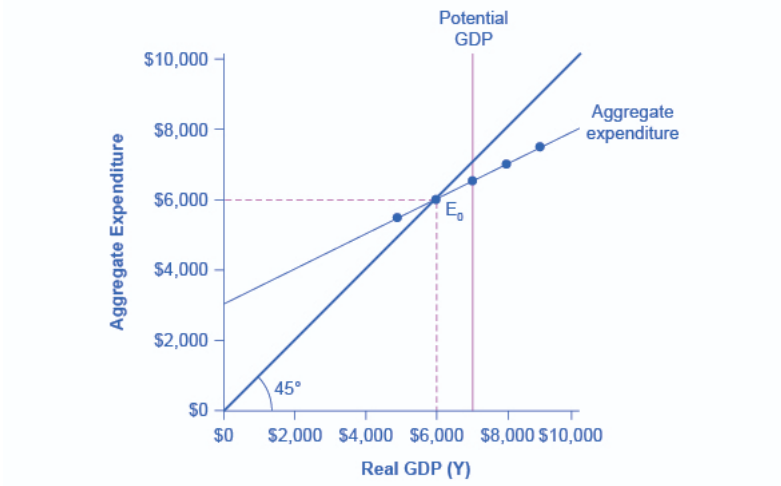
We could build up the Expenditure-Output Model in stages by aggregating (totalling), in order of significance, the spending by the different sectors in the economy. Thus, the addition of investment spending (I) to consumption spending (C) would give us total/aggregate spending by the two most important sectors (in terms of spending power) in a modern, mixed market economy. Consumption spending in South Africa in 2015 was 60% of total expenditure on GDP while gross investment spending (I) contributed 21% of total expenditure on GDP (Statistics South Africa: 2016). Over 80% of spending in the households, therefore, is by consumers and firms. However, because adding **any** autonomous spending (like investment spending (I), government consumption spending (G) and net exports, X-M) to the consumption function simply shifts it up in parallel fashion, there is no need to

painstakingly build up the model to its full form which includes the spending by government as well as net exports.

The Full Keynesian Expenditure-Output Model (C + I + G + X - M)

All the components of aggregate demand—consumption, investment, government spending, and the trade balance—are now in place to build the Keynesian cross diagram. Figure 7 builds up an aggregate expenditure function, based on the numerical illustrations of C, I, G, X, and M that have been used throughout this text. Table 3 reflects Income/Output-Expenditure in our Xurbian economy which uses its own dollar as its monetary unit (Xurbian Dollar). The first column is real GDP or national income, which is what appears on the horizontal axis of the income-expenditure diagram. The second column calculates after-tax income, based on the assumption, in this case, that 30% of real GDP is collected in taxes. The third column is based on an MPC of 0.8, so that as after-tax income rises by \$700 from one row to the next, consumption rises by \$560 (700×0.8) from one row to the next. Investment, government spending, and exports do not change with the level of current national income (since they are assumed to be autonomous). $I = \$500$, $G = \$1,300$, and $X = \$840$, for a total of \$2,640. This total is shown in the fourth column. Imports are 0.1 of real GDP in this example, and the level of imports is calculated in the fifth column. The final column, aggregate expenditures, sums up $C + I + G + X - M$. This aggregate expenditure line is illustrated in Figure 7.

A Keynesian Cross Diagram



Each combination of national income and aggregate expenditure (after-tax consumption, government spending, investment, exports, and imports) is graphed. The equilibrium occurs where aggregate expenditure is equal to national income; this occurs where the aggregate expenditure schedule crosses the 45-degree line, at a real GDP of \$6,000. Potential GDP in this example is \$7,000, so the equilibrium is occurring at a level of output or real GDP below the potential GDP level.

National Income	After-Tax Income	Consumption	Government Spending + Investment + Exports	Imports	Aggregate Expenditure
\$3,000	\$2,100	\$2,280	\$2,640	\$300	\$4,620

National Income	After-Tax Income	Consumption	Government Spending + Investment + Exports	Imports	Aggregate Expenditure
\$4,000	\$2,800	\$2,840	\$2,640	\$400	\$5,080
\$5,000	\$3,500	\$3,400	\$2,640	\$500	\$5,540
\$6,000	\$4,200	\$3,960	\$2,640	\$600	\$6,000
\$7,000	\$4,900	\$4,520	\$2,640	\$700	\$6,460
\$8,000	\$5,600	\$5,080	\$2,640	\$800	\$6,920
\$9,000	\$6,300	\$5,640	\$2,640	\$900	\$7,380

National Income-Aggregate Expenditure Equilibrium

The aggregate expenditure function is formed by stacking on top of each other the consumption function (after taxes), the investment function, the government spending function, the export function, and the import function. The point at which the aggregate expenditure function intersects the vertical axis will be determined by the levels of investment, government, and export expenditures—which do not vary with national income. The upward slope of the aggregate expenditure function will be determined by the marginal propensity to save, the tax rate, and the marginal propensity to import. A higher marginal propensity to save, a higher tax rate, and a higher marginal propensity to import will all make the slope of the aggregate expenditure function flatter—because out of any extra income, more is going to savings or taxes or imports and less to spending on domestic goods and services.

The equilibrium occurs where national income is equal to aggregate expenditure, which is shown on the graph as the point where the aggregate expenditure schedule crosses the 45-degree line. In this example, the equilibrium occurs at \$6,000. This equilibrium can also be read off the table under the figure; it is the level of national income where aggregate expenditure is equal to national income.

Equilibrium in the Keynesian Cross Model

With the aggregate expenditure line in place, the next step is to relate it to the two other elements of the Keynesian cross diagram. Thus, the first subsection interprets the intersection of the aggregate expenditure function and the 45-degree line, while the next subsection relates this point of intersection to the potential GDP line.

Where Equilibrium Occurs

The point where the aggregate expenditure line that is constructed from $C + I + G + X - M$ crosses the 45-degree line will be the equilibrium for the economy. It is the only point on the aggregate expenditure line where the total amount being spent on aggregate demand equals the total level of production. In Figure 7, this point of equilibrium Table 3 happens at \$6,000, which can also be read off Table 3.

Determining the Equilibrium Level of Income/Output Algebraically

The equilibrium level of output/income can also be determined algebraically using the following formula:

Equation:

$$\text{Equilibrium Income/Output} = \text{Total Autonomous Spending} \times \text{Spending Multiplier}$$

Let's test the formula using the Table 3 data according to which the equilibrium level of income/output in the Xurbian economy is \$6000.

First we compute the spending multiplier:

Equation:

$$\text{Spending Multiplier} = 1 / (1 - \text{MPC} * (1 - \text{tax rate}) + \text{MPI})$$

Equation:

$$\text{Spending Multiplier} = 1 / (1 - 0.8 * (1 - 0.3) + 0.1)$$

Equation:

$$\frac{1}{0.54} = 1.852$$

Equation:

$$\text{Total Autonomous Spending} = \text{Autonomous Consumption Spending} + \text{Investment} + \text{Government} + \text{Exports}$$

Equation:

$$\text{Total Autonomous Spending} = \$600 + \$500 + \$1300 + \$840 = \$3240$$

Equation:

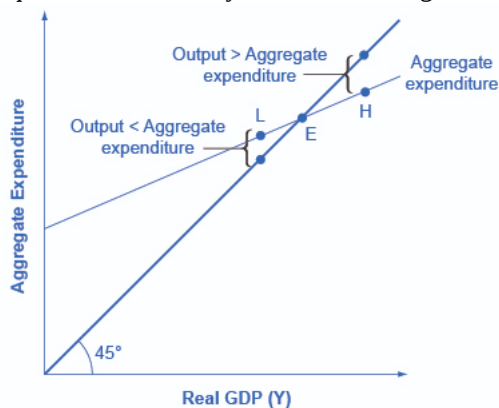
$$\text{Equilibrium Income/Output} = \text{Total Autonomous Spending} \times \text{Spending Multiplier}$$

Equation:

$$\text{Equilibrium Income/Output} = \$3240 \times 1.852 = \$6000.48, \text{ or } \$6000 \text{ (rounded to the nearest Xurbian Doll)}$$

The meaning of “equilibrium” remains the same; that is, equilibrium is a point of balance (in this case between expenditure and output) where no incentive exists to shift away from that outcome. To understand why the point of intersection between the aggregate expenditure function and the 45-degree line is a macroeconomic equilibrium, consider what would happen if an economy found itself to the right of the equilibrium point E, say point H in Figure 8, where output is higher than the equilibrium (that is, where output would be exactly matched by expenditure). At point H, the level of aggregate expenditure is below the 45-degree line, so that the level of aggregate expenditure in the economy is less than the level of output. As a result, at point H, output is piling up unsold (inventories/unsold stock start to pile up in warehouses) — not a sustainable state of affairs.

Equilibrium in the Keynesian Cross Diagram



If output was above the equilibrium level, at H, then the real output is greater than the aggregate expenditure in the economy. This pattern cannot hold, because it would mean that goods are produced but piling up unsold. If output was below the equilibrium level at L, then aggregate

expenditure would be greater than output. This pattern cannot hold either, because it would mean that spending exceeds the number of goods being produced. Only point E can be at equilibrium, where output, or national income and aggregate expenditure, are equal. The equilibrium (E) must lie on the 45-degree line, which is the set of points where national income and aggregate expenditure are equal.

Conversely, consider the situation where the level of output is at point L—where real output is lower than the equilibrium (that is, where spending would exactly match output). In that case, the level of aggregate demand in the economy is above the 45-degree line, indicating that the level of aggregate expenditure in the economy is greater than the level of output. When the level of aggregate demand/aggregate expenditure has emptied the store shelves, it cannot be sustained, either. Firms will respond by increasing their level of production (either by drawing down their inventories of previously unsold stock and/or increasing production). Thus, the equilibrium must be the point where the amount produced and the amount spent are in balance, at the intersection of the aggregate expenditure function and the 45-degree line.

Note:

Finding Equilibrium

A Worked Example: Atlantis Island

Table 4 gives some information on the imaginary island of Atlantis which also uses its own dollar as the official currency (the Atlantic Dollar). The Keynesian model assumes that there is some level of consumption even without income (autonomous consumption spending). That amount is $\$236 - \$216 = \$20$. \$20 will be consumed when national income equals zero. Assume that taxes are 0.2 of real GDP. Let the marginal propensity to save of after-tax income be 0.1. The level of investment is \$70, the level of government spending is \$80, and the level of exports is \$50. Imports are 0.2 of after-tax income. Given these values, you need to complete Table 4 and then answer these questions:

- What is the consumption function?
- What is the equilibrium?
- Why is a national income of \$300 not at equilibrium?
- How do expenditures and output compare at this point?

National Income	Taxes	After-tax income	Consumption	I + G + X	Imports	Aggregate Expenditures
\$300			\$236			
\$400						
\$500						
\$600						

National Income	Taxes	After-tax income	Consumption	I + G + X	Imports	Aggregate Expenditures
\$700						

Step 1. Calculate the amount of taxes for each level of national income(reminder: GDP = national income) for each level of national income using the following as an example:

Equation:

$$\begin{array}{rcl}
 \text{National Income (Y)} & & \$300 \\
 \text{Taxes} = 0.2 \text{ or } 20\% & \times & 0.2 \\
 \text{Tax amount (T)} & & \$60
 \end{array}$$

Step 2. Calculate after-tax income by subtracting the tax amount from national income for each level of national income using the following as an example:

Equation:

$$\begin{array}{rcl}
 \text{National income minus taxes} & & \$300 \\
 & & -\$60 \\
 \text{After-tax income} & & \$240
 \end{array}$$

Step 3. Calculate consumption. The marginal propensity to save is given as 0.1. This means that the marginal propensity to consume is 0.9, since $MPS + MPC = 1$. Therefore, multiply 0.9 by the after-tax income amount using the following as an example:

Equation:

$$\begin{array}{rcl}
 \text{After-tax Income} & & \$240 \\
 \text{MPC} & \times & 0.9 \\
 \text{Consumption} & & \$216
 \end{array}$$

Step 4. Consider why the table shows consumption of \$236 in the first row. As mentioned earlier, the Keynesian model assumes that there is some level of consumption even without income. That amount is $\$236 - \$216 = \$20$.

Step 5. There is now enough information to write the consumption function. The consumption function is found by figuring out the level of consumption that will happen when income is zero. Remember that:

Equation:

$$C = \text{Consumption when national income is zero} + MPC (\text{after-tax income})$$

Let C represent the consumption function, Y represent national income, and T represent taxes.

Equation:

$$\begin{aligned}
 C &= \$20 + 0.9(Y - T) \\
 &= \$20 + 0.9(\$300 - \$60) \\
 &= \$236
 \end{aligned}$$

Step 6. Use the consumption function to find consumption at each level of national income.

Step 7. Add investment (I), government spending (G), and exports (X). Remember that these do not change as national income changes, that is, they are all autonomous:

Step 8. Find imports, which are 0.2 of after-tax income at each level of national income. For example:

Equation:

$$\begin{array}{rcl}
 \text{After-tax income} & & \$240 \\
 \text{Imports of } 0.2 \text{ or } 20\% \text{ of } Y - T & \times & 0.2 \\
 \text{Imports} & & \$48
 \end{array}$$

Step 9. Find aggregate expenditure by adding $C + I + G + X - I$ for each level of national income. Your completed table should look like Table 5.

National Income (Y)	Tax = $0.2 \times Y$ (T)	After-tax income (Y - T)	Consumption $C = \$20 + 0.9(Y - T)$	I + G + X	Minus Imports (M)	Aggregate Expenditures AE = $C + I + G + X - M$
\$300	\$60	\$240	\$236	\$200	\$48	\$388
\$400	\$80	\$320	\$308	\$200	\$64	\$444
\$500	\$100	\$400	\$380	\$200	\$80	\$500
\$600	\$120	\$480	\$452	\$200	\$96	\$556
\$700	\$140	\$560	\$524	\$200	\$112	\$612

Step 10. Answer the question: What is equilibrium? Equilibrium occurs where $AE = Y$. Table 5 shows that equilibrium occurs where national income equals aggregate expenditure at \$500.

Step 11. Find equilibrium mathematically, knowing that national income is equal to aggregate expenditure.

Equation:

$$\begin{aligned}
 Y &= AE \\
 &= C + I + G + X - M \\
 &= \$20 + 0.9(Y - T) + \$70 + \$80 + \$50 - 0.2(Y - T) \\
 &= \$220 + 0.9(Y - T) - 0.2(Y - T)
 \end{aligned}$$

Since T is 0.2 of national income, substitute T with 0.2 Y so that:

Equation:

$$\begin{aligned}
 Y &= \$220 + 0.9(Y - 0.2Y) - 0.2(Y - 0.2Y) \\
 &= \$220 + 0.9Y - 0.18Y - 0.2Y + 0.04Y \\
 &= \$220 + 0.56Y
 \end{aligned}$$

Solve for Y.

Equation:

$$\begin{aligned}
 Y &= \$220 + 0.56Y \\
 Y - 0.56Y &= \$220 \\
 0.44Y &= \$220 \\
 \frac{0.44Y}{0.44} &= \frac{\$220}{0.44} \\
 Y &= \$500
 \end{aligned}$$

Step 12. Answer this question: Why is a national income of \$300 not an equilibrium? At national income of \$300, aggregate expenditures are \$388.

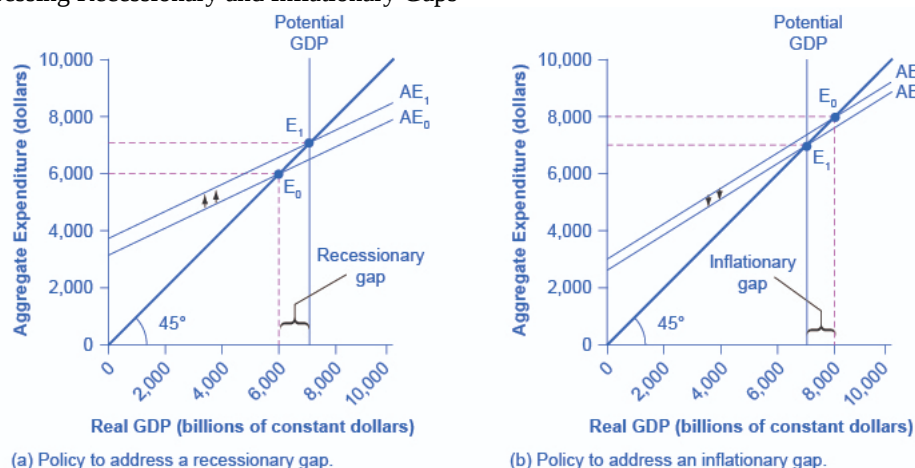
Step 13. Answer this question: How do expenditures and output compare at this point? Aggregate expenditures cannot exceed output (GDP) in the long run, since there would not be enough goods to be bought.

Recessionary and Inflationary Gaps

In the Keynesian cross diagram, if the aggregate expenditure line intersects the 45-degree line at the level of potential GDP, then the economy is in sound shape. There is no recession, and unemployment is low. But there is no guarantee that the equilibrium between spending and output will occur at the potential GDP level of output. The equilibrium might be higher or lower.

For example, Figure 9 (a) illustrates a situation where the aggregate expenditure line intersects the 45-degree line at point E_0 , which is a real GDP of \$6,000, and which is below the potential GDP of \$7,000. In this situation, the level of aggregate expenditure is too low for GDP to reach its full employment level, and unemployment will occur. The distance between an output level like E_0 that is below potential GDP and the level of potential GDP is called a recessionary gap. Because the equilibrium level of real GDP is so low, firms will not wish to hire the full employment number of workers, and unemployment will be high.

Addressing Recessionary and Inflationary Gaps



(a) If the equilibrium occurs at an output below potential GDP, then a recessionary gap exists. The policy solution to a recessionary gap is to shift the aggregate expenditure schedule up from AE_0 to AE_1 , using policies like tax cuts or government spending increases (expansionary fiscal policy). Then the new equilibrium E_1 occurs at potential GDP. (b) If the equilibrium occurs at an output above potential GDP, then an inflationary gap exists.

The policy solution to an inflationary gap is to shift the aggregate expenditure schedule down from AE_0 to AE_1 , using policies like tax increases or spending cuts (contractionary fiscal policy). Then, the new equilibrium E_1 occurs at potential GDP.

What might cause a recessionary gap? Anything that shifts the aggregate expenditure line down is a potential cause of recession, including a decline in consumption, a rise in savings, a fall in investment, a drop in government spending or a rise in taxes, or a fall in exports or a rise in imports. Moreover, an economy that is at equilibrium with a recessionary gap may just stay there and suffer high unemployment for a long time; remember, the meaning of equilibrium is that there is no particular adjustment of prices or quantities in the economy to chase the recession away.

One possible response to a recessionary gap is for the government to reduce taxes or increase spending (expansionary fiscal policy) so that the aggregate expenditure function shifts up from AE_0 to AE_1 . Alternatively, expansionary monetary policy could have the same effect of shifting the consumption function up by reducing interest rates and thus encouraging greater borrowing and spending. When this shift occurs, the new equilibrium E_1 now occurs at potential GDP as shown in Figure 9 (a).

Conversely, Figure 9 (b) shows a situation where the aggregate expenditure schedule (AE_0) intersects the 45-degree line above potential GDP. The gap between the level of real GDP at the equilibrium E_0 and potential GDP is called an inflationary gap. The inflationary gap also requires a bit of interpreting. After all, the Keynesian cross diagram seems to suggest that if the aggregate expenditure function is just pushed up high enough, real GDP can be as large as desired—even doubling or tripling the potential GDP level of the economy. This implication is clearly wrong. An economy faces some supply-side limits on how much it can produce at a given time with its existing quantities of workers, physical and human capital, technology, and market institutions.

The inflationary gap should be interpreted, not as a literal prediction of how large real GDP will be, but as a statement of how much extra aggregate expenditure is in the economy beyond what is needed to reach potential GDP. An inflationary gap suggests that because the economy cannot produce enough goods and services to absorb this level of aggregate expenditures, the spending will instead cause an inflationary increase in the price level. In this way, even though changes in the price level do not appear explicitly in the Keynesian cross equation, the idea of inflation is implicit in the concept of the inflationary gap.

The appropriate Keynesian response to an inflationary gap is shown in Figure 9 (b). The original intersection of aggregate expenditure line AE_0 and the 45-degree line occurs at \$8,000, which is above the level of potential GDP at \$7,000. If AE_0 shifts down to AE_1 , so that the new equilibrium is at E_1 , then the economy will be at potential GDP without pressures for inflationary price increases. The government can achieve a downward shift in aggregate expenditure by increasing taxes on consumers or firms, or by reducing government expenditures (contractionary fiscal policy). Alternatively contractionary monetary policy (increasing short term interest rates to discourage borrowing and spending) would have the same effect of shifting the expenditure function down.

The Multiplier Effect

The Keynesian policy prescription has one final twist. Assume now that for our Atlantis Island economy, the intersection of the aggregate expenditure function and the 45-degree line is at a GDP of \$700 (Atlantic Dollars), while the level of potential GDP for this economy is \$800. By how much does government spending need to be increased so that the economy reaches the full employment GDP? The obvious answer might seem to be $\$800 - \$700 = \$100$; so raise government spending by \$100. But that answer is incorrect. A change of, for example, \$100 in government expenditures will have an effect of more than \$100 on the equilibrium level of Atlantis Island's real GDP.

The logic behind the Keynesian Multiplier effect is that a change in aggregate expenditures circles through the economy: households buy from firms, firms pay workers and suppliers, workers and suppliers buy goods from other firms, those firms pay their workers and suppliers, and so on. In this way, the original change in aggregate expenditures is actually spent more than once. This is called the multiplier effect: An initial increase in spending cycles repeatedly through the economy becoming income to many recipients. If one adds up all the income earned from the many spending cycles it will be some **multiple** of the **original, or first** amount of autonomous spending injected into the economy.

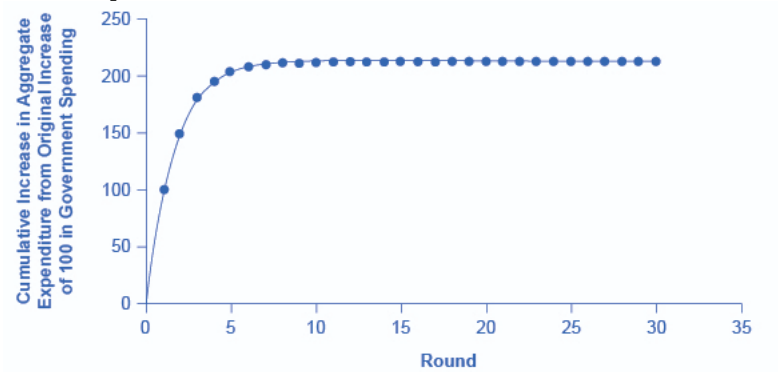
How Does the Multiplier Work?

There are different versions of the Keynesian Multiplier, depending on how complex the analysis of spending and its effect on income and output in the economy is. The **Simple Keynesian Multiplier** does not incorporate the impact of taxation or the tendency that a country has to import goods and services. Both taxation and imports reduce the impact of domestic spending on domestic income and output. In our examples in this chapter we have chosen to work with the **Full Keynesian Multiplier** which incorporates the impact of taxation and imports on domestic spending.

To understand how the multiplier effect works, return to our Atlantis Island example in which the current equilibrium in the Keynesian cross diagram is a real GDP of \$700, or \$100 short of the \$800 needed to be at full employment, potential GDP. If the government spends \$100 to close this gap, someone in the economy receives that spending and can treat it as income. Assume that those who receive this income pay 30% in taxes, save 10% of after-tax income, spend 10% of gross (before tax) total income on imports, and then spend the rest on domestically produced goods and services.

As shown in the calculations in Figure 10 and Table 6, out of the original \$100 in government spending, \$53 is left to spend on domestically produced goods and services. That \$53 which was spent, becomes income to someone, somewhere in the economy. Those who receive that income also pay 30% in taxes, save 10% of after-tax income, and spend 10% of total income on imports, as shown in Table 6, so that an additional \$28.09 (that is, $0.53 \times \$53$) is spent in the third round. The people who receive that income then pay taxes, save, and buy imports, and the amount spent in the fourth round is \$14.89 (that is, $0.53 \times \$28.09$).

The Multiplier Effect



An original increase of government spending of \$100 causes a rise in aggregate expenditure of \$100. But that \$100 is income to others in the economy, and after they save, pay taxes, and buy imports, they spend \$53 of that \$100 in a second round. In turn, that \$53 is income to others. Thus, the original government spending of \$100 is multiplied by these cycles of spending, but the impact of each successive cycle gets smaller and smaller. Given the numbers in this example, the original government spending increase of \$100 raises aggregate expenditure by \$213; therefore, the multiplier in this example is $\$213/\$100 = 2.13$.

Original increase in aggregate expenditure from government spending	100
Which is income to people throughout the economy: Pay 30% in taxes. Save 10% of after-tax income. Spend 10% of income on imports. Second-round increase of...	$70 - 7 - 10 = 53$
Which is \$53 of income to people through the economy: Pay 30% in taxes. Save 10% of after-tax income. Spend 10% of income on imports. Third-round increase of...	$37.1 - 3.71 - 5.3 = 28.09$
Which is \$28.09 of income to people through the economy: Pay 30% in taxes. Save 10% of after-tax income. Spend 10% of income on imports. Fourth-round increase of...	$19.663 - 1.9663 - 2.809 = 14.89$

Calculating the Multiplier Effect

Thus, over the first four rounds of aggregate expenditures, the impact of the original increase in government spending of \$100 creates a rise in aggregate expenditures of $\$100 + \$53 + \$28.09 + \$14.89 = \$195.98$. Table 6 shows these total aggregate expenditures after these first four rounds, and then the figure shows the total aggregate expenditures after 30 rounds. The additional boost to aggregate expenditures is shrinking in each round of consumption. After about 10 rounds, the additional increments are very small indeed—nearly invisible to the naked eye. After 30 rounds, the additional increments in each round are so small that they have no practical consequence. After 30 rounds, the cumulative value of the initial boost in aggregate expenditure is approximately \$213. Thus, the government spending increase of \$100 eventually, after many cycles, produced an increase of \$213 in aggregate expenditure and real GDP. In this example, the multiplier is $\$213/\$100 = 2.13$.

Calculating the Multiplier

Fortunately for everyone who is not carrying around a computer with a spreadsheet program to project the impact of an original increase in expenditures over 20, 50, or 100 rounds of spending, there is a formula for calculating the multiplier. Below are both the simple and full Keynesian Multiplier formulas:

Equation:

$$\text{Simple Keynesian Spending Multiplier} = 1/(1 - \text{MPC}) \text{ or } 1/(\text{MPS})$$

Equation:

$$\text{Full Keynesian Spending Multiplier} = 1/(1 - \text{MPC} * (1 - \text{tax rate}) + \text{MPI})$$

The data from Figure 10 and Table 6 is:

- Marginal Propensity to Save (MPS) = 10%
- Tax rate = 30%
- Marginal Propensity to Import (MPI) = 10%

The MPC is equal to $1 - \text{MPS}$, or 0.9. Therefore, the spending multiplier is:

Equation:

$$\begin{aligned}\text{Full Keynesian Spending Multiplier} &= \frac{1}{1 - 0.9(1 - 0.3) + 0.1} \\ &= \frac{1}{0.47} \\ &= 2.13\end{aligned}$$

A change in spending of \$100 multiplied by the spending multiplier of 2.13 is equal to a change in GDP of \$213. Not coincidentally, this result is exactly what was calculated in Figure 10 after many rounds of expenditures cycling through the economy.

The size of the multiplier is determined by what proportion of the marginal dollar of income goes into taxes, saving, and imports. These three factors are known as “leakages,” because they determine how much demand “leaks out” in each round of the multiplier effect. If the leakages are relatively small, then each successive round of the multiplier effect will have larger amounts of demand, and the multiplier will be high. Conversely, if the leakages are relatively large, then any initial change in demand will diminish more quickly in the second, third, and later rounds, and the multiplier will be small. Changes in the size of the leakages—a change in the marginal propensity to save, the tax rate, or the marginal propensity to import—will change the size of the multiplier.

In the Simple Keynesian Multiplier both the tax rate and marginal propensity to import are ignored (that is, they are reduced to zero). This should have the effect of making the multiplier more powerful since less spending is leaking out of the domestic economy (to government as taxes and to foreigners in payment for imports). Thus **all** local income is spent locally (nothing to taxes and nothing on imports). The effect on the local economy is bound

to be very good. The Simple Keynesian Multiplier for our Atlantis Island economy is derived below. Note that it is considerably bigger than the Full Keynesian Multiplier.

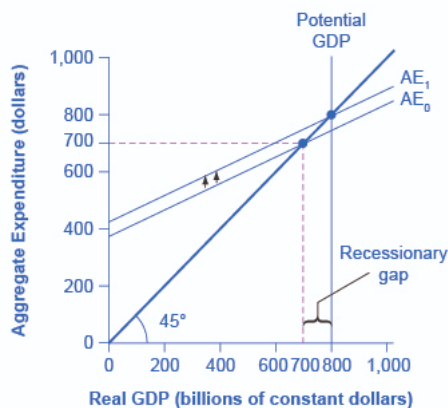
Equation:

$$\begin{aligned}\text{Simple Keynesian Spending Multiplier} &= \frac{1}{1 - (0.7)} \\ &= \frac{1}{0.33} \\ &= 3.03\end{aligned}$$

Calculating Keynesian Policy Interventions

Returning to the original question: How much should government spending be increased to produce a total increase in real GDP of \$100? If the goal is to increase aggregate demand by \$100, and the multiplier is 2.13, then the increase in government spending to achieve that goal would be $\$100/2.13 = \47 . Government spending of approximately \$47, when combined with a multiplier of 2.13 (which is, remember, based on the specific assumptions about tax, saving, and import rates), produces an overall increase in real GDP of \$100, restoring the economy to potential GDP of \$800, as Figure 11 shows.

The Multiplier Effect in an Expenditure-Output Model



The power of the multiplier effect is that an increase in expenditure has a larger increase on the equilibrium output. The increase in expenditure is the vertical increase from AE_0 to AE_1 . However, the increase in equilibrium output, shown on the horizontal axis, is clearly larger.

The multiplier effect is also visible on the Keynesian cross diagram. Figure 11 shows the example we have been discussing: a recessionary gap with an equilibrium of \$700, potential GDP of \$800, the slope of the aggregate expenditure function (AE_0) determined by the assumptions that taxes are 30% of income, savings are 0.1 of after-tax income, and imports are 0.1 of before-tax income. At AE_1 , the aggregate expenditure function is moved up to reach potential GDP.

Now, compare the vertical shift upward in the aggregate expenditure function, which is \$47, with the horizontal shift outward in real GDP, which is \$100 (as these numbers were calculated earlier). The rise in real GDP is more than double the rise in the aggregate expenditure function. (Similarly, if you look back at Figure 9, you will see that the vertical movements in the aggregate expenditure functions are smaller than the change in equilibrium output that is produced on the horizontal axis. Again, this is the multiplier effect at work.) In this way, the power of the multiplier is apparent in the income–expenditure graph, as well as in the arithmetic calculation.

The multiplier does not just affect government spending, but applies to any change in autonomous spending in the economy. Say that business confidence declines and investment falls off, or that the economy of a leading trading partner slows down so that export sales decline. These changes will reduce aggregate expenditures, and then will have an even larger effect on real GDP because of the multiplier effect. So changes in Investment spending (I), Government spending (G) or Export spending (X) can all kick off the multiplier process.

Multiplier Tradeoffs: Stability versus the Power of Macroeconomic Policy

Is an economy healthier with a high multiplier or a low one? With a high multiplier, any change in aggregate demand will tend to be substantially magnified, and so the economy will be more unstable. With a low multiplier, by contrast, changes in aggregate demand will not be multiplied much, so the economy will tend to be more stable.

However, with a low multiplier, government policy changes in taxes or spending will tend to have less impact on the equilibrium level of real output. With a higher multiplier, government policies to raise or reduce aggregate expenditures will have a larger effect. Thus, a low multiplier means a more stable economy, but also weaker government macroeconomic policy, while a high multiplier means a more volatile economy, but also an economy in which government macroeconomic policy is more powerful.

Key Concepts and Summary

The expenditure-output model or Keynesian cross diagram shows how the level of aggregate expenditure (on the vertical axis) varies with the level of economic output (shown on the horizontal axis). Since the value of all macroeconomic output also represents income to someone somewhere else in the economy, the horizontal axis can also be interpreted as national income. The equilibrium in the diagram will occur where the aggregate expenditure line crosses the 45-degree line, which represents the set of points where aggregate expenditure in the economy is equal to output (or national income). Equilibrium in a Keynesian cross diagram can happen at potential GDP, or below or above that level.

The consumption function shows the upward-sloping relationship between national income and consumption. The marginal propensity to consume (MPC) is the amount consumed out of an additional dollar of income. A higher marginal propensity to consume means a steeper consumption function; a lower marginal propensity to consume means a flatter consumption function. The marginal propensity to save (MPS) is the amount saved out of an additional dollar of income. It is necessarily true that $MPC + MPS = 1$. The investment function is drawn as a flat line, showing that investment in the current year does not change with regard to the current level of national income. However, the investment function will move up and down based on the expected rate of return in the future. Government spending is drawn as a horizontal line in the Keynesian cross diagram, because its level is determined by political considerations, not by the current level of income in the economy. Taxes in the basic Keynesian cross diagram are taken into account by adjusting the consumption function. The export function is drawn as a horizontal line in the Keynesian cross diagram, because exports do not change as a result of changes in domestic income, but they move as a result of changes in foreign income, as well as changes in exchange rates. The import function is drawn as a downward-sloping line, because imports rise with national income, but imports are a subtraction from aggregate demand. Thus, a higher level of imports means a lower level of expenditure on domestic goods.

In a Keynesian cross diagram, the equilibrium may be at a level below potential GDP, which is called a recessionary gap, or at a level above potential GDP, which is called an inflationary gap.

The multiplier effect describes how an initial change in aggregate demand generated several times as much as cumulative GDP. The size of the spending multiplier is determined by three leakages: spending on savings, taxes, and imports. We consider two versions of the Keynesian Multiplier:

Equation:

$$\text{Simple Keynesian Spending Multiplier} = 1/(1 - MPC) \text{ or } 1/(MPS)$$

Equation:

$$\text{Full Keynesian Spending Multiplier} = \frac{1}{1 - (\text{MPC} \times (1 - \text{tax rate}) + \text{MPI})}$$

An economy with a lower multiplier is more stable—it is less affected either by economic events or by government policy than an economy with a higher multiplier.

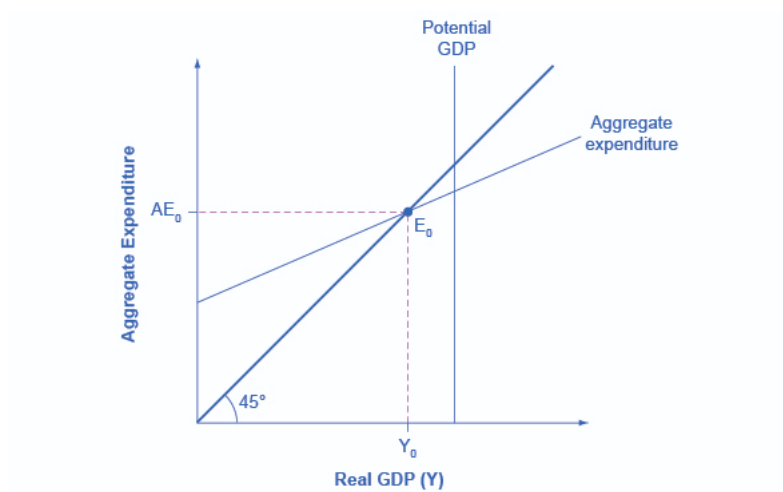
Self-Check Questions

Exercise:

Problem: Sketch the aggregate expenditure-output diagram with the recessionary gap.

Solution

The following figure shows the aggregate expenditure-output diagram with the recessionary gap.

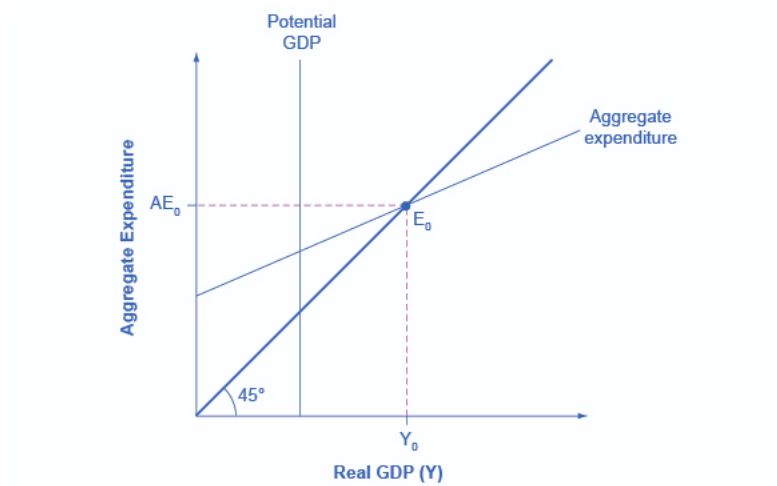


Exercise:

Problem: Sketch the aggregate expenditure-output diagram with an inflationary gap.

Solution

The following figure shows the aggregate expenditure-output diagram with an inflationary gap.



Exercise:

Problem:

Let's use the example of the small town of Orania in the Northern Cape in this exercise. The aim of the town is to preserve Afrikaans and the Afrikaner identity by keeping their language and culture alive (Orania, Northern Cape: 2016). Anyone who regards themselves as an Afrikaner and identifies with Afrikaner ethnicity is welcome in Orania. The residents of Orania aspire to the right to self-determination as provided by the Constitution of South Africa. Orania has its own currency (the Ora) which is pegged at par with the South African Rand (Ora 1 = R1). We will assume for the sake of our example that the Orania economy has the following characteristics (of course the values in real life would be much higher!):

Y = National income

Taxes = $T = 0.25Y$

C = Consumption = $400 + 0.85(Y - T)$

$I = 300$

$G = 200$

$X = 500$

$M = 0.1(Y - T)$

Find the equilibrium for this economy. If potential GDP is Ora 3,500, then what change in government spending is needed to achieve this level? Do this problem two ways. First, plug 3,500 into the equations and solve for G . Second, calculate the multiplier and figure it out that way.

Solution

First, set up the calculation.

Equation:

$$AE = 400 + 0.85(Y - T) + 300 + 200 + 500 - 0.1(Y - T)$$

$$AE = Y$$

Then insert Y for AE and $0.25Y$ for T .

Equation:

$$\begin{aligned}
Y &= 400 + 0.85(Y - 0.25Y) + 300 + 200 + 500 - 0.1(Y - 0.25Y) \\
Y &= 1400 + 0.6375Y - 0.075Y \\
0.4375Y &= 1400 \\
Y &= 3200
\end{aligned}$$

If full employment is Ora 3,500, then one approach is to plug in 3,500 for Y throughout the equation, but to leave G as a separate variable.

Equation:

$$\begin{aligned}
Y &= 400 + 0.85(Y - 0.25Y) + 300 + G + 500 + 0.1(Y - 0.25Y) \\
3500 &= 400 + 0.85(3500 - 0.25(3500)) + 300 + G + 500 - 0.1(3500 - 0.25(3500)) \\
G &= 3500 - 400 - 2231.25 - 1300 - 500 + 262.5 \\
G &= 331.25
\end{aligned}$$

A G value of 331.25 is an increase of 131.25 from its original level of 200.

Alternatively, the multiplier is that, out of every Ora spent, 0.25 goes to taxes, leaving 0.75, and out of after-tax income, 0.15 goes to savings and 0.1 to imports. Because $(0.75)(0.15) = 0.1125$ and $(0.75)(0.1) = 0.075$, this means that out of every Ora spent: $1 - 0.25 - 0.1125 - 0.075 = 0.5625$.

Thus, using the formula, the multiplier is:

Equation:

$$\frac{1}{1 - 0.5625} = 2.2837$$

To increase equilibrium GDP by Ora 300, it will take a boost of $300/2.2837$, which again works out to Ora 131.25.

Exercise:

Problem:

Table 7 represents the data behind a Keynesian cross diagram. Our example economy in this exercise is again Atlantis Island which uses its own Atlantic Dollar as its currency. Assume that the tax rate is 0.4 of national income; the (Marginal Propensity to Consume) MPC out of the after-tax income is 0.8; investment is \$2,000; government spending is \$1,000; exports are \$2,000 and imports are 0.05 of after-tax income. What is the equilibrium level of output for this economy?

National Income	After-tax Income	Consumption	I + G + X	Minus Imports	Aggregate Expenditures
\$8,000		\$4,340			
\$9,000					
\$10,000					
\$11,000					
\$12,000					

National Income	After-tax Income	Consumption	I + G + X	Minus Imports	Aggregate Expenditures
\$13,000					

Solution

The following table illustrates the completed table. The equilibrium level is italicized.

National Income	After-tax Income	Consumption	I + G + X	Minus Imports	Aggregate Expenditures
\$8,000	\$4,800	\$4,340	\$5,000	\$240	\$9,100
\$9,000	\$5,400	\$4,820	\$5,000	\$270	\$9,550
<i>\$10,000</i>	<i>\$6,000</i>	<i>\$5,300</i>	<i>\$5,000</i>	<i>\$300</i>	<i>\$10,000</i>
\$11,000	\$6,600	\$5,780	\$5,000	\$330	\$10,450
\$12,000	\$7,200	\$6,260	\$5,000	\$360	\$10,900
\$13,000	\$7,800	\$6,740	\$5,000	\$4,390	\$11,350

The alternative way of determining equilibrium is to solve for Y, where Y = national income, using: $Y = AE = C + I + G + X - M$

Equation:

$$Y = \$500 + 0.8(Y - T) + \$2,000 + \$1,000 + \$2,000 - 0.05(Y - T)$$

Solving for Y, we see that the equilibrium level of output is $Y = \$10,000$.

Exercise:

Problem:

Explain how the multiplier works. Use an MPC (Marginal Propensity to Consume) of 80% in an example.

Solution

The multiplier refers to how many times a dollar will turnover in the economy. It is based on the Marginal Propensity to Consume (MPC) which tells how much of every dollar received will be spent. If the MPC is 80% then this means that out of every one dollar received by a consumer, \$0.80 will be spent. This \$0.80 is received by another person. In turn, 80% of the \$0.80 received, or \$0.64, will be spent, and so on. The impact of the multiplier is diluted when the effect of taxes and expenditure on imports is considered. To derive the multiplier, take the $1/1 - F$; where F is equal to percent of savings, taxes, and expenditures on imports.

Review Questions

Exercise:

Problem: What is on the axes of an expenditure-output diagram?

Exercise:

Problem: What does the 45-degree line show?

Exercise:

Problem: What determines the slope of a consumption function?

Exercise:

Problem:

What is the marginal propensity to consume, and how is it related to the marginal propensity to import?

Exercise:

Problem:

Why are the investment function, the government spending function, and the export function all drawn as flat lines?

Exercise:

Problem: Why does the import function slope down? What is the marginal propensity to import?

Exercise:

Problem: What are the components on which the aggregate expenditure function is based?

Exercise:

Problem: Is the equilibrium in a Keynesian cross diagram usually expected to be at or near potential GDP?

Exercise:

Problem: What is an inflationary gap? A recessionary gap?

Exercise:

Problem: What is the multiplier effect?

Exercise:

Problem: Why are savings, taxes, and imports referred to as “leakages” in calculating the multiplier effect?

Exercise:

Problem:

Will an economy with a high multiplier be more stable or less stable than an economy with a low multiplier in response to changes in the economy or in government policy?

Exercise:

Problem: How do economists use the multiplier?

Critical Thinking Questions

Exercise:

Problem:

What does it mean when the aggregate expenditure line crosses the 45-degree line? In other words, how would you explain the intersection in words?

Exercise:

Problem:

Which model, the AD/AS or the AE model better explains the relationship between rising price levels and GDP? Why?

Exercise:

Problem:

What are some reasons that the economy might be in a recession, and what is the appropriate government action to alleviate the recession?

Exercise:

Problem:

What should the government do to relieve inflationary pressures if the aggregate expenditure is greater than potential GDP?

Exercise:

Problem:

Two countries are in a recession. Country A has an MPC of 0.8 and Country B has an MPC of 0.6. In which country will government spending have the greatest impact?

Exercise:

Problem:

Compare two policies: a tax cut on income or an increase in government spending on roads and bridges. What are both the short-term and long-term impacts of such policies on the economy?

Exercise:

Problem:

What role does government play in stabilizing the economy and what are the tradeoffs that must be considered?

Exercise:

Problem:

If there is a recessionary gap of \$100 billion, should the government increase spending by \$100 billion to close the gap? Why? Why not?

Exercise:

Problem: What other changes in the economy can be evaluated by using the multiplier?

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The Role Of Government In A Market Economy

This module examines the economic role of government in a market economy



Figure 1: The Union Buildings, Pretoria
(Credit: Parsons, 2014)

Key Summary

In this chapter we:

- Introduce the government sector as part of a modern, mixed market economy
- Discuss the economic roles of government with particular reference to its **allocation**, **redistribution** and **stabilisation functions**.

The role of government in society, according to Ebeling (2016) has been and remains the most fundamental question in all political discussions and debates. He notes that the answer to this question determines the nature of the social order and how people are expected and allowed to interact with one another: on the basis of either force or freedom. Ebeling observes that Governments may be narrowly limited to perform the essential task in market economies of protecting each individual's right to his life, liberty, and honestly acquired property. Alternatively Government may try to modify, influence, or dictate the conduct of the citizenry.

In the first case, Government is assigned a narrow role: that of impartial umpire, enforcing the societal rules against assault, murder, robbery, and fraud. All human interactions are to be based on mutual consent and voluntary association and exchange. In the second case, Government is assigned a broader role in which it is expected to be an active player in people's affairs, using its legitimate power of coercion (through rules and regulations) to determine how the members of the society may live, work, and associate with each other. In the second case Government tries to assure certain outcomes or forms of behavior considered desirable by those who wield political authority.

The exact roles of Government, and the extent of its involvement in society and the economy, remain controversial issues. However, the fact is that citizens in the modern era have certain expectations of government. These range from the narrowly defined traditional roles of government such as providing public goods and services such as law and order, education, healthcare and other vital infrastructure (including roads, sanitation and water and electricity reticulation) to broader economic roles. These could include, for example, actively promoting economic growth or taking measures to reduce unemployment and poverty or helping to reduce inflation.

What is clear from the **Circular Flow Model of Economic Activity** in **Figure 2** is that government is well placed, through its interactions with households and firms, to exercise an important economic role. Government, through its taxation and spending activities, is a major participant in modern, mixed market economies. Our focus in this chapter is on the

economic reasons for government participation in the economy. Other interest areas in this chapter include government spending and taxation and economic policy in general (which is normally directed by government).

So Who is "Government"?

"Government" is sometimes referred to as the "public sector" which, in South Africa (as in many other countries), comprises different levels: Central/National, Provincial and Local. Each different level of government has unique functions. **Central/National** government is further divided into three separate spheres: law-making (legislative authority), the actual work of governing (executive authority) and the courts (judicial authority). The two houses of Parliament are the National Assembly, charged with the responsibility of creating laws for the country as a whole, and the National Council of Provinces, which ensures those laws will meet the different needs of each province (Alexander: 2015).

Provinces constitute the next level of government in South Africa and are allowed legislative and executive powers - alongside the powers of the national government - over a number of issues. **Provincial** government powers include control over gambling, education (excluding university education), the environment, healthcare, police services, vehicle licensing and welfare (Alexander: 2015). Provinces can take responsibility for administration of these issues if they have the capacity to do so. They also have exclusive powers over a number of areas, including abattoirs, ambulance services, liquor licenses, local museums, culture and recreation, and provincial roads and traffic.

Local government in South Africa is the lowest level of government. Local government is expected to administer cities and smaller regions (Alexander: 2015). These are known as municipalities. There are three categories of municipality. Metropolitan municipalities (Category A) govern the major city regions. District municipalities (Category C) are for wider areas outside the cities (like counties in the United States and United Kingdom). Districts are further divided into local municipalities (Category B). Local government is (or should be) at the forefront of service delivery: providing

sewerage and sanitation, refuse removal, water, local roads, traffic control and street lighting, among others.

The broad labels of "Government" or the "Public Sector" include **public corporations** or State Owned Enterprises (SOE's) such as Eskom, Transnet and Denel, among others. Eskom is the world's eleventh-largest power utility in terms of generating capacity. Transnet is wholly-owned by government and is the largest and most crucial part of the freight logistics chain that delivers goods to each and every South African. Denel (Pty) Limited is the largest manufacturer of defense equipment in South Africa (South Africa. Department of Public Enterprises: undated).

[missing_resource: circflow1.jpg] **Figure 2:**
The Circular Flow Model of Economic Activity
(Adapted from: The Circular flow of the economy:
2012)

Figure 2 presents the "big picture" of government's economic role. Government, as a whole, provides households and firms with public goods and services (law and order, healthcare, education and general infrastructure, among others). Government also makes transfer payments in particular to households. These include state pensions, subsidies and other grants designed to combat poverty and income inequality. Households and firms pay taxes which are used to finance government operations. Government uses its tax revenue to purchase inputs from firms as well as resources from households required to produce public goods and services. Government payments accrue to firms and households as income. In this way there is an ongoing flow of goods and services, income and spending between government (the public sector) and households and firms (the private sector).

An Overview Of Government's Economic Role

To understand the role of government, it will be useful to distinguish four broad types of government involvement in the economy. First, the

government attempts to respond to market failures to allocate resources efficiently. In a particular market, efficiency means that the quantity produced is determined by the intersection of a demand curve that reflects all the benefits of consuming a particular good or service and a supply curve that reflects the opportunity costs of producing it. Second, government agencies act to encourage or discourage the consumption of certain goods and services. The prohibition of drugs such as "Tik/Nyaope", heroin and cocaine is an example of government seeking to discourage consumption of these drugs. Third, the government redistributes income through programs such as various types of welfare grants, subsidies and state pensions. Fourth, the government can use its spending and tax policies to influence the level of economic activity and the price level (The role of government in a market economy: 2012).

Market Failure

Markets do not always achieve efficient solutions. Private markets are likely to produce less than the efficient quantities of public goods such as national defense. They may produce too much of goods that generate external costs and too little of goods that generate external benefits. In cases of imperfect competition, we have seen that the market's output of goods and services is likely to fall short of the efficient level. In all these cases, it is possible that government intervention will move production levels closer to their efficient quantities. In the next three sections, we shall review how a government could improve efficiency in the cases of public goods, external costs and benefits, and imperfect competition.

Public Goods

A public good is a good or service for which exclusion is prohibitively costly and for which the marginal cost of adding another consumer is zero. This means that many consumers can benefit from the provision of a public good with no significant decline in the availability or quality of that public good or service. This characteristic of public goods and services is termed **non-rivalry**. National defense, law enforcement, and generally available knowledge are examples of public goods. The difficulty posed by a public good is that, once it is produced, it is freely available to everyone. No

consumer can be excluded from consumption of the good on grounds that he or she has not paid for it. Public goods thus have the characteristics of **non-rivalry** and **non-excludability**.

Consequently, each consumer has an incentive to be a **free rider** in consuming the public good in question (since he or she cannot be excluded from its benefit), and the firms providing a public good do not get a signal (e.g. willingness to pay) from consumers that reflects their benefit of consuming the good. Certainly we can expect some benefits of a public good to be revealed in the market. If the government did not provide national defense, for example, we would expect some defense to be produced, and some people would contribute to its production. But because free-riding behavior will be common, the market's production of public goods will fall short of the efficient level.

The theory of public goods is an important argument for government involvement in the economy. Government agencies may either produce public goods themselves, as do local police departments, or pay private firms to produce them, as is the case with many government-sponsored research efforts. An important debate in the provision of public education revolves around the question of whether education should be produced by the government, as is the case with traditional public schools, or produced by the private sector, as is done in private schools. The same considerations apply to healthcare.

External Costs and Benefits

External costs are imposed when an action by one person or firm harms another, outside of any market exchange. The social cost of producing a good or service equals the private cost plus the external cost of producing it. In the case of external costs, private costs are less than social costs (The role of government in a market economy: 2012).

Similarly, external benefits are created when an action by one person or firm benefits another, outside of any market exchange. The social benefit of an activity equals the private benefit revealed in the market plus external benefits. When an activity creates external benefits, its social benefit will be greater than its private benefit.

The lack of a market transaction means that the person or firm responsible for the external cost or benefit does not face the full cost or benefit of the choice involved. We expect markets to produce more than the efficient quantity of goods or services that generate external costs (in the case of **negative externalities**) and less than the efficient quantity of goods or services that generate external benefits (in the case of **positive externalities**).

Consider the case of the proposed fracking (hydraulic fracturing) of the Karoo for oil and gas reserves. Fakir (2014), among many others, has questioned the benefits for South Africa of using this technology to exploit the Karoo's alleged reserves of oil and gas. The Karoo is an environmentally fragile and water scarce region. Hydraulic fracturing requires extensive volumes of water to be pumped into the ground to break up (fracture) the rock to release oil and gas which then gushes to the surface. Water wastage and environmental degradation and pollution of scarce water resources are likely to result from this production process.

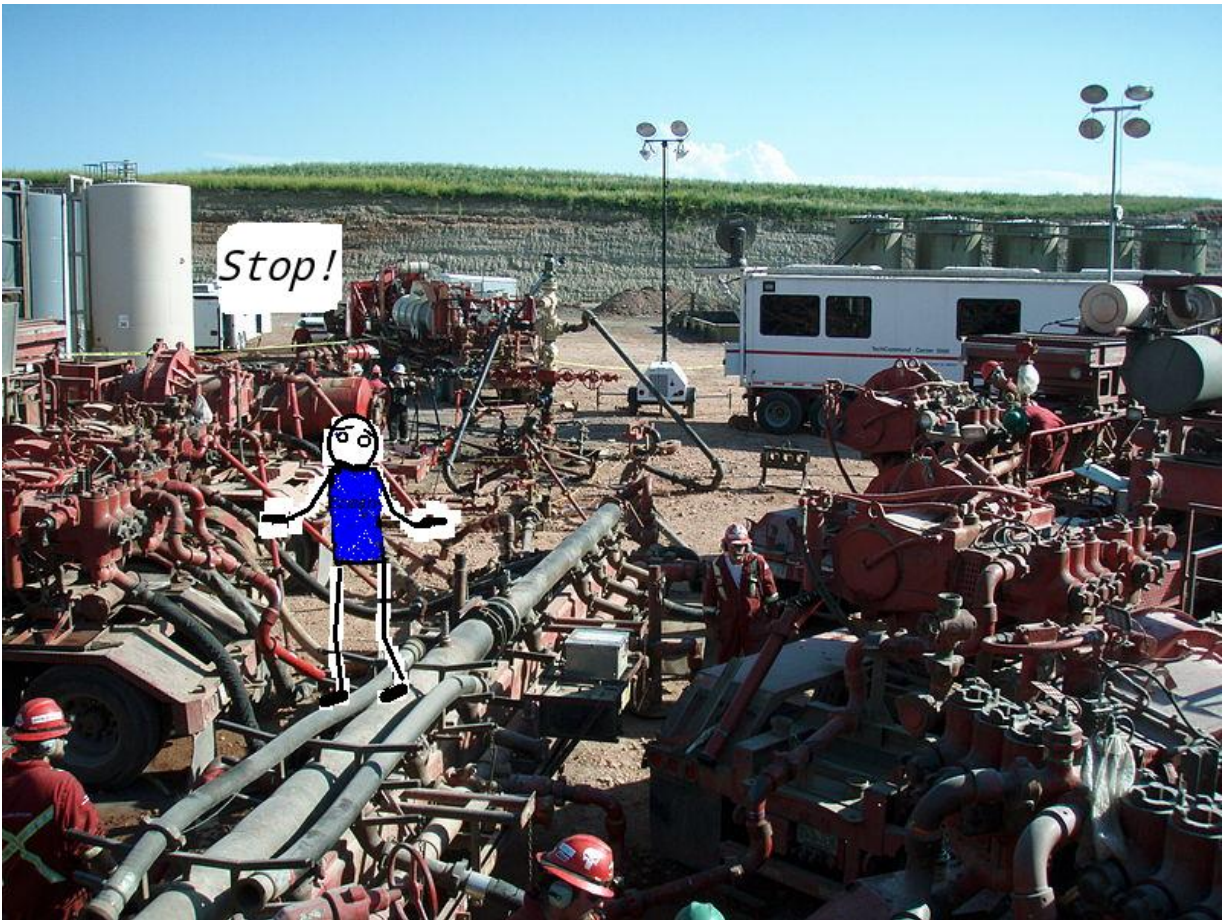


Figure 3. A fracking operation. (Credit: adapted from Doubek: 2011)

The cost of this wastage, degradation and pollution are external costs; the fracking firms that generate it will not face them. These firms will face some, but not all, of the costs of their production choices (they will not face the external costs). The water wastage, environmental degradation and pollution are **negative externalities** associated with fracking, that is, they are external costs that will be experienced by people other than the fracking firms. Karoo residents and farmers, tourists and South Africans at large will be deprived of water resources and the character of the beautiful, wild Karoo will be changed for good. Fakir (2014) complains that that this amounts to socialising the costs of fracking while privatising its benefits.

Inoculations against infectious diseases create external benefits. A person getting a flu shot, for example, receives private benefits; he or she is less

likely to get the flu. But there will be external benefits as well: Other people will also be less likely to get the flu because the person getting the shot is less likely to have the flu (**positive externalities** associated with flu shots). Because this latter benefit is external, the social benefit of flu shots exceeds the private benefit, and the market is likely to produce less than the efficient quantity of flu shots.

Imperfect Competition

In a perfectly competitive market, price equals marginal cost. If competition is imperfect, however, individual firms face downward-sloping demand curves and will charge prices greater than marginal cost. Consumers in such markets will be faced by prices that exceed marginal cost, and the allocation of resources will be inefficient.

An imperfectly competitive private market will produce less of a good than is efficient. As we saw in the chapter on monopoly, government agencies seek to prohibit monopoly in most markets and to regulate the prices charged by those monopolies that are permitted. In South Africa this task is performed by the Competition Commission which is a statutory body constituted in terms of the Competition Act, No 89 of 1998 by the Government of South Africa empowered to investigate, control and evaluate monopoly practices. In addition South Africa's Competition Tribunal adjudicates competition matters, in accordance with the Competition Act and has jurisdiction throughout South Africa.

Common Property Resources

There are some goods that do not fall neatly into the categories of private good or public good. While it is easy to classify a pizza as a private good and a city park as a public good, what about an item that is nonexcludable and rivalrous, such as Abalone and other marine resources?

Abalone (Perlemoen in South Africa) is a common name for any of a group of small to very large marine (sea) mollusks. The thick inner layer of the shell is composed of nacre (mother-of-pearl), which in many species is highly iridescent, giving rise to a range of strong, changeable colors, which make the shells attractive to humans as decorative objects, jewelry, and as a source of colorful mother-of-pearl (Abalone: 2016). The flesh of abalones is

widely considered to be a desirable food, and is consumed raw or cooked in a variety of cultures. Because almost anyone with a small boat, snorkel, and mask, can harvest Abalone, it is essentially **non-excludable**. At the same time, fishing for Abalone is **rivalrous**; once a diver catches one Abalone it cannot be caught by another diver.

Goods that are non-excludable and rivalrous are called common resources. Because the coastal waters of South Africa are open to all fishermen, and because any Abalone that you catch is Abalone that I cannot catch, common resources like the Abalone tend to be over harvested which means that the populations cannot recover and can eventually become extinct.

The problem of over harvesting common resources is not a new one, but ecologist Garret Hardin (1968) put the tag “Tragedy of the Commons” to the problem in an article in the magazine Science. Economists view this as a problem of property rights. Since nobody owns the ocean, or the Abalone that crawl on the sand beneath it, no one individual has an incentive to protect that resource and responsibly harvest it. To address the issue of over harvesting Abalone and other marine fisheries, economists typically advocate simple devices like fishing licenses, harvest limits, and shorter fishing seasons. When the population of a species drops to critically low numbers, governments have even banned the harvest until biologists determine that the population has returned to sustainable levels. In fact, such is the case with the Abalone, the harvesting of which has been effectively banned in South Africa since 2008 (Benton: 2007).



Figure 4. A rhino poaching scene, South Africa (Credit: adapted from Waschefort: 2010)

The phenomenon of the "Tragedy of the Commons" (people being more concerned about their private property than property that belongs to society at large) is currently playing out in the tragedy of the world's disappearing rhinos. The majority (98.8%) of white rhinos are to be found in only four countries: South Africa, Namibia, Zimbabwe, and Kenya (World Wildlife Fund: 2016). These second largest all land creatures are the heritage of all people and Africans in particular. Tourists flock to Africa to experience its beauty and wildlife and when they do so they spend money and create local jobs. However, Rhino numbers are being decimated by poachers who kill the whole animal just to get the horn and are funded by foreign syndicates especially from Vietnam, China, Thailand and Korea (Anon., 2016). World trade in Rhino horn has been banned but this ban, within South Africa, was controversially recently lifted on the strength that rhino were being responsibly farmed in this country (Farrington: 2016).

Responding to Market Failure

In each of the models of market failure we have reviewed here—public goods, external costs and benefits, common property, and imperfect competition—the market may fail to achieve the efficient result. There is a potential for government intervention to move inefficient markets closer to the efficient solution.

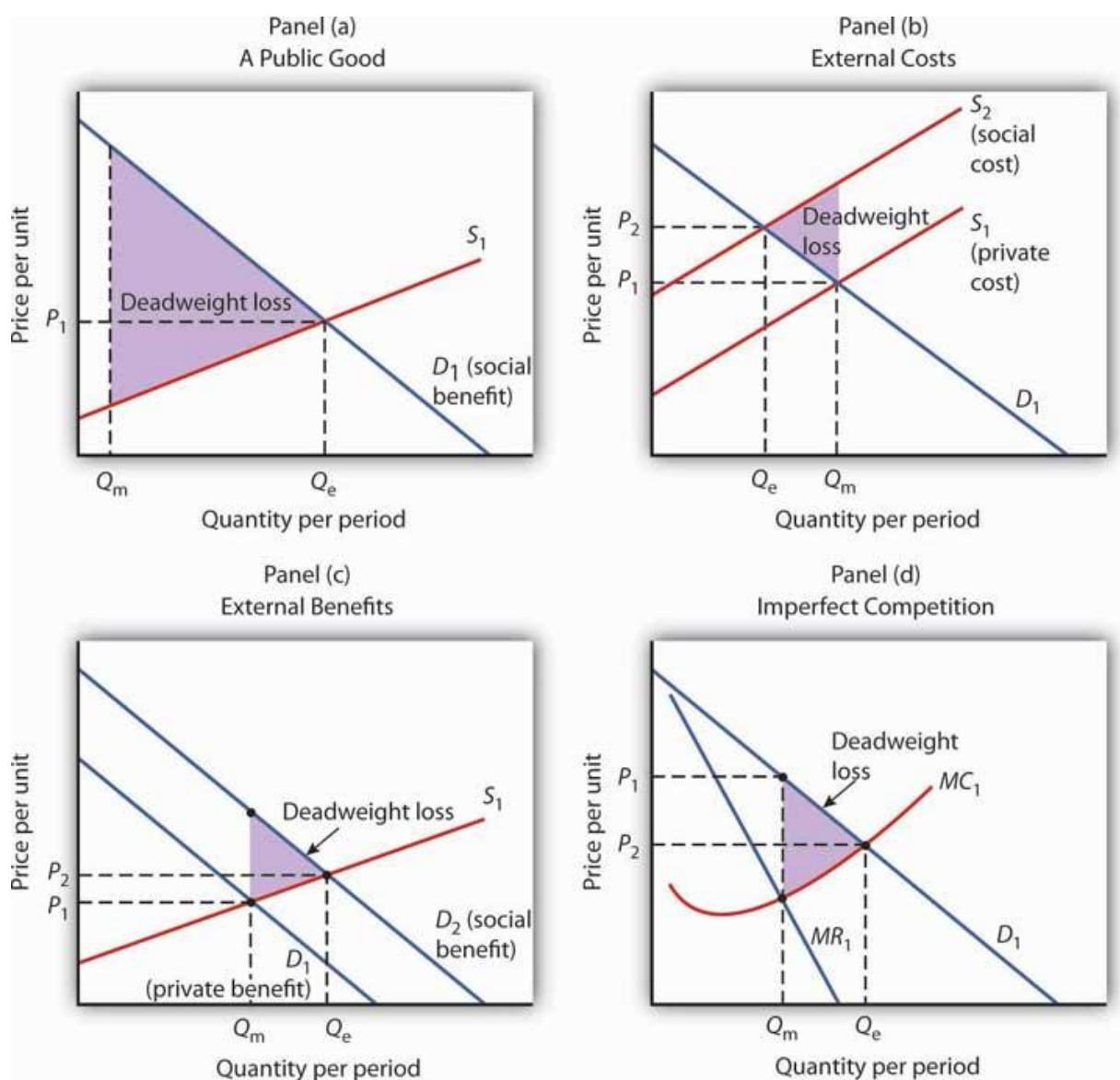


Figure 5. (Source: The role of government in a market economy: 2012)

Panel (a) of Figure 5 "Correcting Market Failure" illustrates the case of a public good. The market will produce some of the public good; suppose it produces the quantity Q_m . But the demand curve that reflects the social benefits of the public good, D_1 , intersects the supply curve at Q_e ; that is the efficient quantity of the good. Public sector provision (or subsidising the private supply) of a public good may move the quantity closer to the efficient level.

Panel (b) shows a good that generates external costs. Without government intervention, these costs would not be reflected in the market solution. The supply curve, S_1 , will be based only on the private costs associated with the good. The market will produce Q_m units of the good at a price P_1 . If the government were to confront producers with the external cost of the good, perhaps with a tax on the activity that creates the cost, the supply curve would shift to S_2 and reflect the social cost of the good. The quantity would fall to the efficient level, Q_e , and the price would rise to P_2 .

Panel (c) gives the case of a good that generates external benefits. The demand curve revealed in the market, D_1 , reflects only the private benefits of the good. Incorporating the external benefits of the good gives us the demand curve D_2 that reflects the social benefit of the good. The market's output of Q_m units of the good falls short of the efficient level Q_e . The government may seek to move the market solution toward the efficient level through subsidies (to consumers to boost demand) or other measures to encourage the activity that creates the external benefit.

Finally, Panel (d) shows the case of imperfect competition. A firm facing a downward-sloping demand curve such as D_1 will select the output Q_m at which the marginal cost curve MC_1 intersects the marginal revenue curve MR_1 . The government may seek to move the solution closer to the efficient level, defined by the intersection of the marginal cost and demand curves. This might be achieved by regulating monopoly behaviour (as per South Africa's Competition Commission and Competition Tribunal) and/or by implementing price controls.

Imperfect Knowledge and Asymmetric Information as Sources of Market failure

While it is important to recognize the potential gains from government intervention to correct market failure, we must recognize the difficulties inherent in such efforts. Government officials may lack the information they need to select the efficient solution. Even if they have the information, they may have goals other than the efficient allocation of resources. Each instance of government intervention involves an interaction with utility-maximizing consumers and profit-maximizing firms, none of whom can be assumed to be passive participants in the process. So, while the potential exists for improved resource allocation in cases of market failure, government intervention may not always achieve it.

The late George Stigler, winner of the Nobel Prize for economics in 1982, once remarked that people who advocate government intervention to correct every case of market failure reminded him of the judge at an amateur singing contest who, upon hearing the first contestant, awarded first prize to the second (The role of government in a market economy: 2012). Stigler's point was that even though the market is often an inefficient allocator of resources, so is the government likely to be. Government may improve on what the market does; it can also make it worse. The choice between the market's allocation and an allocation with government intervention is always a choice between imperfect alternatives.

Of course government intervention always poses the risk of corruption. According to Quintal (2016) 83% of South Africans believe that corruption is increasing and 79% believe that government is doing a poor job of combating corruption. She reports further that South Africa is ranked amongst those countries perceived to have a serious corruption problem and is on par those countries suffering from endemic (occurring in every facet of life) corruption.



Figure 6 (Credit: South African Parliament listening to debate: 2015)

Income Redistribution

The proposition that a private market will allocate resources efficiently if the efficiency condition is met always comes with a qualification: the allocation of resources will be efficient given the initial distribution of income. If 5% of the people receive 95% of the income, it might be efficient to allocate roughly 95% of the goods and services produced to them. But many people (at least 95% of them!) might argue that such a distribution of income is undesirable and that the allocation of resources that emerges from it is undesirable as well.

There are several reasons to believe that the distribution of income generated by a private economy might not be satisfactory. For example, the incomes people earn are in part due to luck. Much income results from

inherited wealth and thus depends on the family into which one happens to have been born. Likewise, talent is distributed in unequal measure. Many people suffer handicaps that limit their earning potential. Changes in demand and supply can produce huge changes in the values—and the incomes—the market assigns to particular skills. Given all this, many people argue that incomes should not be determined solely by the marketplace.

A more fundamental reason for concern about income distribution is that people care about the welfare of others. People with higher incomes often have a desire to help people with lower incomes. This preference is demonstrated in voluntary contributions to charity and in support of government programs to redistribute income.

A public goods argument can be made for government programs that redistribute income. Suppose that people of all income levels feel better off knowing that financial assistance is being provided to the poor and that they experience this sense of well-being whether or not they are the ones who provide the assistance. In this case, helping the poor is a public good. When the poor are better off, other people feel better off; this benefit is nonexclusive. One could thus argue that leaving private charity to the marketplace is inefficient and that the government should participate in income redistribution. Whatever the underlying basis for redistribution, it certainly occurs. The governments of every country in the world make some effort to redistribute income.

Programs to redistribute income can be divided into two categories. One transfers income to poor people; the other transfers income based on some other criterion. A **means-tested** transfer payment is one for which the recipient qualifies on the basis of income; means-tested programs transfer income from people who have more to people who have less. Examples of means-tested programs in South Africa include Grants for Older Persons and Care Dependency Grants (Ferreira: 2016). To qualify for these types of grants recipients must earn less than some specified maximum level of income. A non-means-tested transfer payment is one for which income is not a qualifying factor. Examples of non-means-tested programs in South

Africa include War Veterans, Disability and Foster Child Grants (Ferreira: 2016).

Macroeconomic Instability

Prior to Keynes's work, mainstream economic thought held that a state of general equilibrium existed in the economy: because the needs of consumers are always greater than the capacity of the producers to satisfy those needs, everything that is produced will eventually be consumed once the appropriate price is found for it. This perception is reflected in Say's law (discussed previously) which states that individuals produce so that they can either consume what they have manufactured or sell their output so that they can buy someone else's output. This argument rests upon the assumption that if a surplus of goods or services exists, they would naturally drop in price to the point where they would be consumed.

Keynes's theory overturned the mainstream thought of the time and brought about a greater awareness of structural inadequacies: problems such as unemployment, for example, are not viewed as a result of moral deficiencies like laziness, but rather result from imbalances in demand and whether the economy was expanding or contracting. Keynes argued that because there was no guarantee that the goods that individuals produce would be met with demand, unemployment was a natural consequence especially in the instance of an economy undergoing contraction. He saw the economy as unable to maintain itself at full employment and believed that it was necessary for the government to step in and put under-utilized savings to work through government spending. Thus, according to Keynesian theory, some individually rational microeconomic-level actions such as not investing savings in the goods and services produced by the economy, if taken collectively by a large proportion of individuals and firms, can lead to outcomes wherein the economy operates below its potential output and growth rate.

Prior to Keynes, a situation in which aggregate demand for goods and services did not meet supply was referred to by classical economists as a general glut, although there was disagreement among them as to whether a

general glut was possible. Keynes argued that when a glut occurred, it was the over-reaction of producers and the laying off of workers that led to a fall in demand and perpetuated the problem. Keynesians therefore advocate an active stabilization policy to reduce the amplitude of the business cycle, which they rank among the most serious of economic problems. According to the theory, government spending, taxation and borrowing (fiscal policy) can be used to manipulate aggregate demand which, in turn, impacts on economic growth, employment and inflation. The primary instrument of **fiscal policy** in South Africa is the national budget presented annually by the Minister of Finance (generally in February).

A Summary of The Rationale For Government Intervention in The Economy

Government's economic role in a market economy, in summary, is three-fold. Firstly it must allocate resources to correct the various instances of market failure: the failure of the market to provide public goods, the failure of the market to internalize externalities (both positive and negative), the failure of the market to protect common property and the failure of the market to keep monopoly practices in check. Thus government has an **allocation role/function**.

Secondly, government has a **distributive (or redistributive) function** in the sense that it must take steps to achieve a more socially acceptable and equitable distribution of income than that produced by an unregulated market economy. Thirdly, government's **stabilisation function** refers to the steps taken by government to address the macroeconomic instability (unemployment, inflation and balance of payments instability) that is a normal aspect of market economies.

Exercises

Exercise 1

If public utilities are a natural monopoly, what would be the danger in deregulating them?

Exercise 2

If public utilities are a natural monopoly, what would be the danger in splitting them up into a number of separate competing firms?

Exercise 3

Identify the following situations as an example of a negative or a positive externality:

- a. You are a bird watcher, and your neighbor has put up several bird feeders in their yard as well as planting trees and flowers that attract birds.
- b. Your neighbor paints his house a horrible color.
- c. Investments in private education raise your country's standard of living.
- d. Rubbish dumped in the river upstream flows downstream right past your home.
- e. Your roommate is a smoker, but you are a nonsmoker.

Exercise 4

Identify whether the market supply curve will shift right or left or will stay the same for the following:

- a. Firms in an industry are required to pay a fine for their emissions of carbon dioxide.
- b. Companies are sued for polluting the water in a river.
- c. Power plants in a specific city are not required to address the impact of their emissions on the quality of air.
- d. Companies that use fracking to remove oil and gas from rock are required to clean up the damage.

Exercise 5

For each of your answers to Exercise 4, will equilibrium price rise or fall or stay the same?

Exercise 6

What is an externality?

Exercise 7

Give an example of a positive externality and an example of a negative externality.

Exercise 8

What is the difference between private costs and social costs?

Exercise 9

In a market without environmental regulations, will the supply curve for a firm take into account private costs, external costs, both, or neither? Explain.

Exercise 10

Which of the following goods or services are non-excludable?

- police protection
- streaming music from satellite transmission programs
- roads
- primary education
- cell phone service

Exercise 11

Are the following goods nonrivalrous in consumption?

- slice of pizza
- laptop computer
- public radio
- ice cream cone

Exercise 12

What are the two key characteristics of public goods?

Exercise 13

Name two public goods and explain why they are public goods.

Exercise 14

What is the free rider problem?

Exercise 15

Provide two examples of goods/services that can be classified as (at least partly) private goods/services even though they are provided by government. Why?

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Introduction to Government Budgets and Fiscal Policy

class="introduction"



Figure 1. South African Airways, a State Owned Enterprise (Credit: adapted from South African Airways in Durban: 2016)

Note:

Bye bye South African Airways?

In August 2016 South Africa's Finance Minister (who heads the National Treasury) refused to accede to South African Airways (SAA) request for a R5 billion government guarantee, citing government concerns. The guarantee would permit the national airline to “renew its going concern status, get its financials passed by Parliament, and continue borrowing money to survive” (Presidency denies Zuma rift with National Treasury over SAA board: 2016)

Political parties in South Africa have pointed out that SAA has been plagued with financial problems for over a decade now with assessed losses of R18 billion to date and little sign of a turnaround in sight (How much money SAA has lost over the past 10 years: 2016). It has been noted that in the 2013/14 financial year, the airline incurred a loss of R2.5 billion while the financial statements for 2014/15 - as at August 2016 - had yet to be finalized. An audit of SAA found that the airline had made a R648 million loss in the first six months of 2016.

There is concern that, aside from allegations of serious corruption involving these institutions, South Africa's state owned enterprises (SOEs) are costing the economy billions annually. SAA, Eskom (the state owned electricity utility) and other SOE's are alleged to hold R408.9 billion in government guarantees between them as at 2016 (How much money SAA has lost over the past 10 years: 2016). This amounts to a serious claim on government finances.

Why do government finances (the national budget) create such intense debates? Should SAA and other non-performing SOEs not be sold off to bring money into the state's coffers and to pay down the national debt? In this chapter, we will examine the national budget, taxation, and fiscal policy. We will also look at the annual budget deficits and the national debt.

Note:**Introduction to Government Budgets and Fiscal Policy**

In this chapter, you will learn about:

- Government Spending
- Taxation
- Government Deficits and the National Debt

All levels of government— national, provincial, and local—have budgets that show how much revenue the government expects to receive in taxes and other income and how the government plans to spend it. Budgets,

however, can shift dramatically within a few years, as policy decisions and unexpected events shake up earlier tax and spending plans.

In this chapter, we revisit **fiscal policy**. Fiscal policy is one of two policy tools for fine tuning the economy (the other is monetary policy). While monetary policy is made by policymakers at the South African Reserve Bank, fiscal policy is made by the Minister of Finance and the National Treasury (Department of Finance).

The discussion of fiscal policy focuses on government taxing and spending which affect aggregate demand (or aggregate expenditure). All government spending and taxes affect the economy, but fiscal policy focuses strictly on the policies of the national government. In this chapter we review South African government spending and taxes as the primary instruments of fiscal policy.

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Government Spending

By the end of this section, you will be able to:

- Identify U.S. budget deficit and surplus trends over the past five decades
- Explain the differences between the U.S. federal budget, and state and local budgets

Government spending covers a range of services provided by the national, provincial, and local governments. When the national government spends more money than it receives in taxes in a given year, it runs a **budget deficit**. Conversely, when the government receives more money in taxes than it spends in a year, it runs a **budget surplus**. If government spending and taxes are equal, it is said to have a **balanced budget**. For example, the South African government - according to its National Treasury medium term estimates - has budgeted to spend R139 billion more than it expects to collect in taxes in the 2016/2017 financial year (South Africa. National Treasury: 2016). This deficit is estimated to be about 3.2% of anticipated GDP in the 2016/2017 financial year.

This section presents an overview of government spending in South Africa.

Total South African Government Spending

Government spending in South Africa averaged R304 455.29 million from 1960 until 2016, reaching an all time high of R632 428 million in the first quarter (3 months) of 2016 and a record low of R65 991 million in the first quarter of 1960 (South Africa Government debt: 2016). This is an increase of nearly ten times since 1960. South African national government expenditure surpassed R1 trillion in the 2012/13 fiscal year, nearly double the R567 billion spent in 2007/08 (Statistics South Africa: 2014). Clearly, government has become a more significant role player in the South African economy over time. However, comparing spending over time in nominal Rands is misleading because it does not take into account inflation or growth in population and the real economy. A more useful method of

comparison is to examine government spending as a percent of GDP over time.

Figure 1 shows the level of national government final consumption spending from 1960 to 2015 as a share of GDP. This graphic emphasises government's growing role in South Africa's economy. Figure 2 highlights some major national budget items in terms of annual government consumption expenditure for selected years since 1994.

The national budget highlights government's priorities and its agenda. Thus, as is evident from Figure 2, social upliftment and economic development are clearly important goals of government especially since 1994. This is evident from the fact that around 40% of annual budgeted government expenditure has consistently been reserved for education, healthcare and social protection (welfare grants and subsidies). It is interesting to note that expenditure on defence has declined significantly since the dawn of democracy in 1994. Also noteworthy are government's annual debt service costs (annual interest payments on the national debt) which constitute a significant budget item. This is due to a reduction in the national debt between 2000 and 2010. However, since then the national debt has again been creeping up as is evident from the increase in annual debt service costs since 2010.

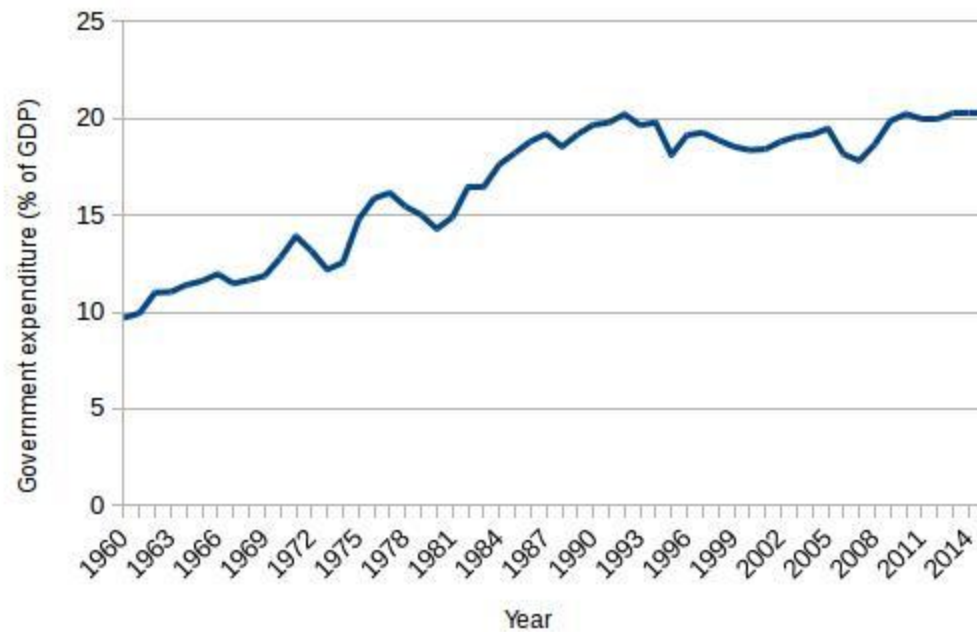


Figure 1 General government expenditure as a percent of GDP, 1960-2015 (Source: South Africa. National Treasury: 2016)

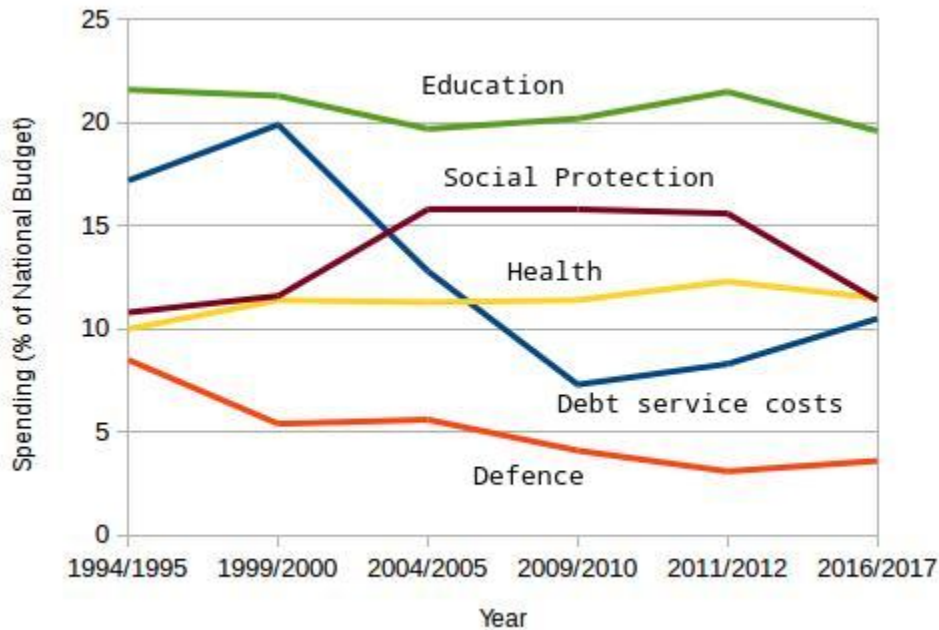


Figure 2 Selected government expenditure as a percent of total budgeted government expenditure for selected years (Source: South African Reserve Bank: 2013)

Each year, the government borrows funds from South African citizens and foreigners to cover its budget deficits. It does this by selling securities (Treasury bonds, notes, and bills)—in essence borrowing from the public and promising to repay with interest in the future. Figure 3 shows that, from 1982 to 2014 (with the exceptions of 1989 and 2006/2007), the South African government has run annual budget deficits, and thus borrowed funds, in almost every year. It had very small budget surpluses in 1989 and again in 2006 and in 2007 but has since returned to deficits (World Bank: 2016b). Budget deficits add to the national debt and so increase annual debt service costs.

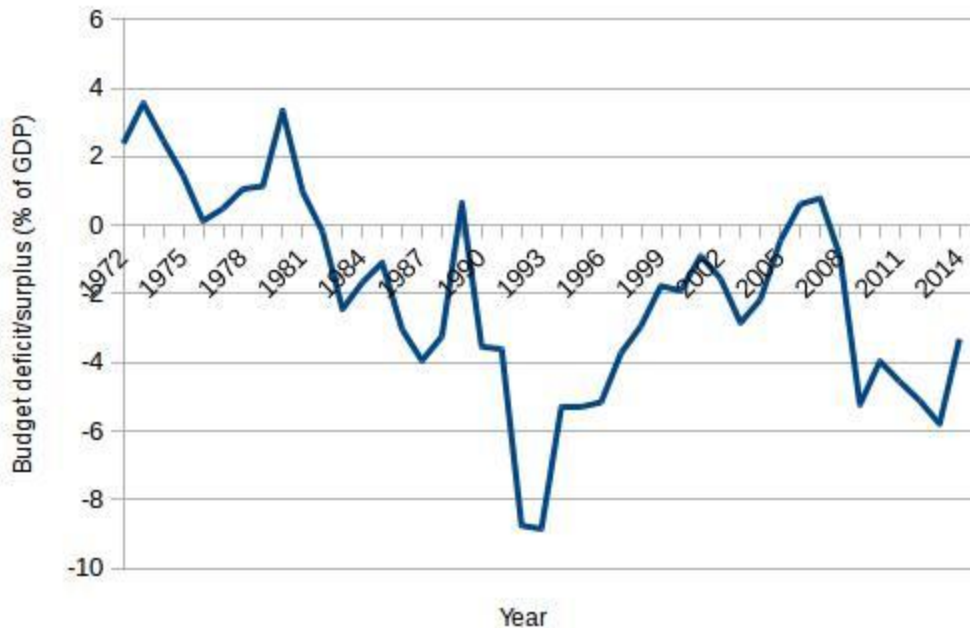


Figure 3 South Africa's annual budget deficit/surplus as a percent of GDP record, 1982-2014 (Source: World Bank: 2016a)

Figure 2 reflects that government's annual debt service costs (interest payments on the national debt) have fallen considerably since 1994/1995 from 17.2% of budgeted annual government expenditure to about 10.5% in the 2016/2017 financial year. Even so, this constitutes R147.7 billion Rands of interest alone which is due in 2016/2017 on total government debt of over two trillion Rands.

Such big figures make more sense when seen from another perspective. The national debt presently is 40% of the value of South Africa's expected GDP in 2016/2017 (National Debt of South Africa: 2016). Interest on this debt works out at R3,677.00 Rands per second. If this debt was split equally among all of South Africa's 54.5 million people, each person (men, women and children) would be in debt to the tune of R37,427. If the current national debt was converted to U.S. one dollar notes, you could wrap these notes end-to-end around the Earth 552 times with the amount of \$1 notes that would be required to settle the debt! Alternatively, if you laid the \$1 bills on top of each other they would make a pile 15,497 km high! South

Africa's citizens expect a lot from their government, but more government means more cost for everyone.



Figure 4

Check out South Africa's National Debt Clock [here](#).

We investigate the patterns of government borrowing and debt in more detail later in this chapter, but first we need to clarify the difference between the deficit and the debt. *The deficit is not the debt.* The difference between the deficit and the debt lies in the time frame. The government deficit (or surplus) refers to what happens with the national government budget each year. The government debt is accumulated over time; it is the sum of all past deficits and surpluses. If you borrow R10,000 per year for each of the four years of university or college, you might say that your

annual deficit was R10,000, but your accumulated debt over the four years is R40,000.

Figure 5 summarizes total budgeted government spending for 2016/2017 according to functional category while Figure 6 offers a summary of government spending according to economic classification. By examining the different categories of budgeted government spending one can discern the different functions of government that require funding support in a typical market economy: allocation of resources, redistribution of income and economic stabilization. Total budgeted government expenditure for the 2016/2017 financial year was R1463.3 billion (South Africa. National Treasury: 2016).

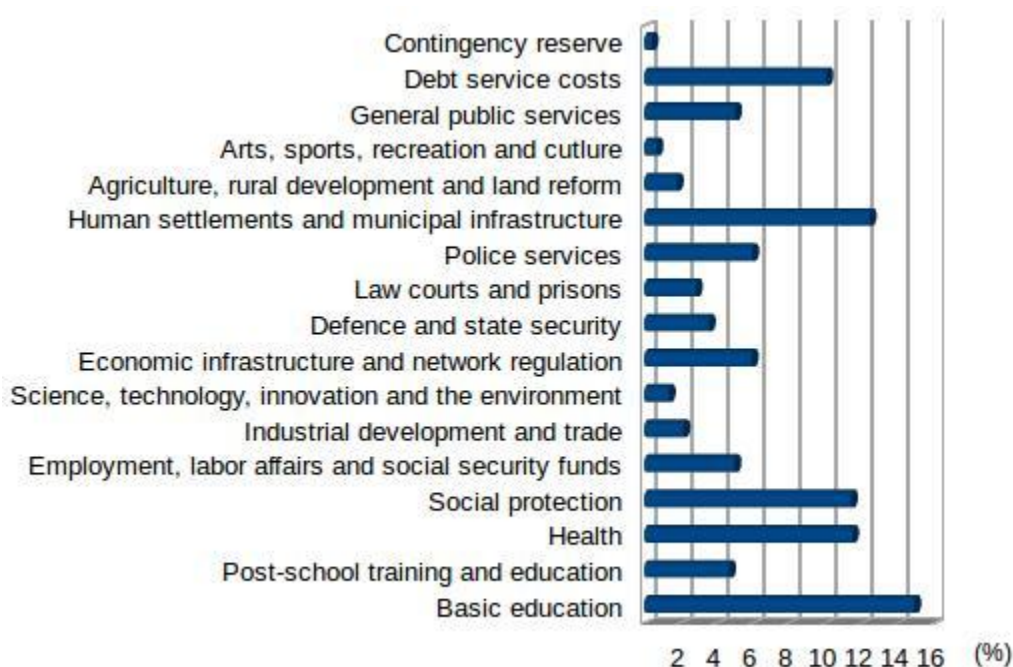


Figure 5 Functional categories of government spending as a percent of total budgeted spending, 2016/2017 (Source: South Africa. National Treasury: 2016)

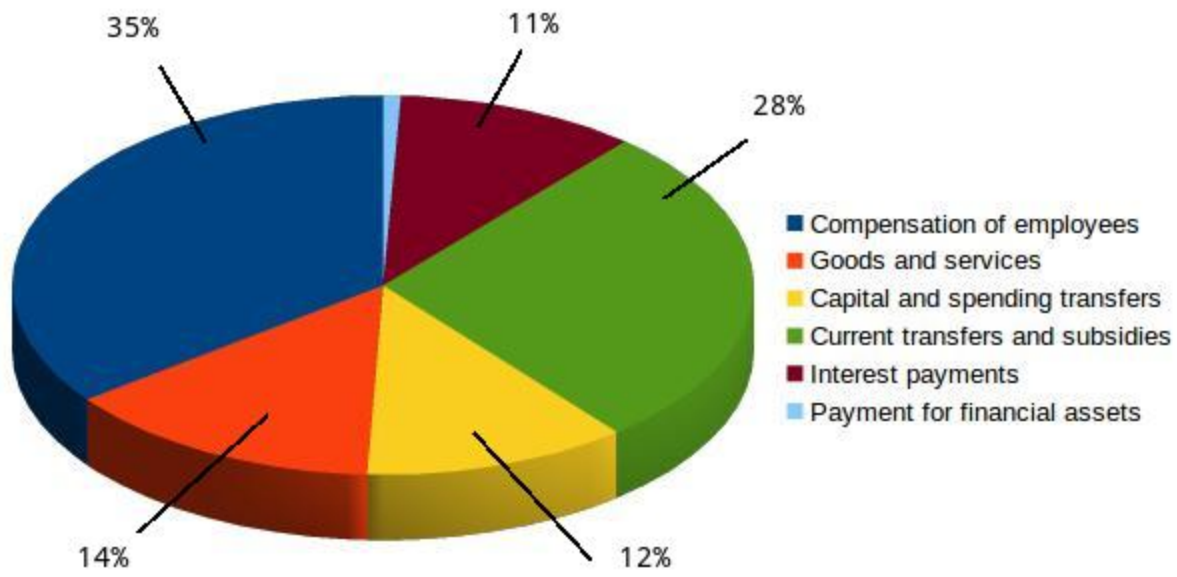


Figure 6 Economic classification of government spending as a percent of total budgeted spending, 2016/2017 (Source: adapted from South Africa. National Treasury: 2016)

Table 1 shows how budgeted government spending in 2016/2017 in South Africa was apportioned between the different levels of government. Note that national government departments are set to account for most government spending at 48.1% of the total national budget. This is followed by provincial governments at 42.9% and lastly by local government at 9%.

Entity/item	2016/2017 Medium Term Estimate (R billions)
National departments	559.8
Indirect transfers to provinces	3.6
Indirect transfers to local government	7.8
Provinces	499.8
Equitable share	410.7
Conditional grant	89.1
Local government	104.9
Equitable share	52.6
Conditional grant	41.1
General fuel levy shared between provinces	11.2
Non-interest allocation	1164.6
Debt service cost	147.7
Contingency reserve	6
Main budget expenditure	1318.3
% increase over 2015/2016	5.70%
% shares	
National departments	48.10%
Provincial government	42.90%
Local government	9.00%
	100.00%

Table 1 Division of spending between different levels of government, 2016/2017 (Source: adapted from South Africa. National Treasury: 2016)

Provincial and Local Government Spending

Provincial government

The division of tax revenue (to fund government spending) between national, provincial and local government is based on the powers and functions assigned to each level of government, as well as their ability to raise revenue (South Africa. National Treasury: 2016). Provincial governments in South Africa are responsible for implementing nationally determined policies in education, health, social development, agriculture, roads and human settlements. Thus government's role of **allocating resources** to the equitable provision of **public goods and services** is evident not only at national level but also at the provincial level. Table 2 shows the division of revenue between South Africa's provinces for the 2016/2017 financial year (provincial equitable share).

Province	2016/2017 Medium Term Estimate (R billions)
Eastern Cape	58060
Free State	22995
Gauteng	79600
KZN	87898
Limpopo	48709
Mpumalanga	33450
Northern Cape	10863
North West	28062
Western Cape	41062
	410699

Table 2 Division of revenue (equitable share) between South Africa's various provinces, 2016/2017 (Source: adapted from South Africa. National Treasury: 2016)

Provincial equitable share allocations are complemented by conditional grants that fund infrastructure and various programmes such as the provision of free meals to learners and the treatment of HIV and Aids and tuberculosis. This latter spending allocation is evidence of government's **redistribution of income** role which is aimed at addressing inequitable income distributions and poverty.

The provincial conditional grants are also used to fund clinic upgrades in national health insurance pilot districts and to introduce incentives in the provincial roads maintenance grant to reward provinces that implement best practices in planning and completing road maintenance (South Africa. National Treasury: 2016). Education infrastructure and early childhood development services are also funded by means of provincial conditional grants. Table 3 summarizes the proposed conditional grants for South Africa's provinces by functional category for the 2016/2017 financial year.

Direct Conditional Grants	2016/2017 Medium Term Estimates (R millions)
Agriculture support programme	1642
Ilima/Letsema project	491
Community library Services	1357
Education infrastructure	9614
Maths, science and technology	362
National school nutrition programme	6006
HIV/AIDS and tuberculosis	15291
Health facility revitalisation	5273
Health professions training development	2477
National tertiary services	10847
Human settlements development	18284
Mass participation and sports development	556
Provincial roads maintenance	10203
Public transport operations	5400
Other direct grants	1344
Total direct conditional grants	89146
Indirect transfers	3636
School infrastructure backlog	2375
National health insurance	1261

Table 3 Provincial conditional grants by functional category, 2016/2017 (Source: adapted from South Africa. National Treasury: 2016)

Local Government

Local governments have the responsibility of providing basic services such as water and sanitation, electricity reticulation, municipal transport and roads, refuse removal, and community services. In addition they provide free or subsidized basic services to poor households. In South Africa, as in many other countries, municipalities fund a large portion of the costs of providing these services from user charges and property rates within their own tax base (South Africa. National Treasury: 2016). Once again we see from Table 4, at local government level, evidence of general government's **allocation of resources (to the provision of public goods and services)** and **redistribution of income** roles in a typical mixed market economy.

Transfers to local government	2016/2017 Medium Term Estimates (R millions)
<u>Equitable share and related</u>	<u>52569</u>
General fuel levy shared with metros	11224
<u>Direct conditional grants</u>	<u>41132</u>
Municipal infrastructure	14914
Water services infrastructure	2845
Urban settlements development	10839
Integrated national electrification programme	1946
Public transport network infrastructure	5593
Neighbourhood development participation	624
Local government financial management	465
Regional bulk infrastructure	1850
Municipal demarcation board	297
Other direct transfers	1758
<u>Total direct transfers</u>	<u>104925</u>
<u>Indirect transfers</u>	<u>7773</u>
Integrated national electrification programme	3526
Neighbourhood development participation	22
Regional bulk infrastructure	3479
Water services infrastructure	312
Municipal systems improvement	84
Bucket eradication	350

Table 4 Transfers to local government, 2016/2017
(Source: adapted from South Africa. National Treasury: 2016)

Key Concepts and Summary

Fiscal policy is the set of policies that relate to national government spending, taxation, and borrowing. In recent decades, the level of South African national government spending and taxes, expressed as a share of GDP, has increased significantly since the 1960s but seems to have levelled off at around 20% of GDP. Traditionally significant South African national budget items include spending on education, health, social protection and on annual debt servicing. Together they account for about half of total budgeted government expenditure. When a government spends more than it collects in taxes, it is said to have a budget deficit. When a government collects more in taxes than it spends, it is said to have a budget surplus. If government spending and taxes are equal, it is said to have a balanced budget. The sum of all past deficits and surpluses make up the government debt.

Self-Check Questions

Exercise:

Problem:

When governments run budget deficits, how do they make up the differences between tax revenue and spending?

Solution:

The government borrows funds by selling Treasury bonds, notes, and bills.

Exercise:

Problem:

When governments run budget surpluses, what is done with the extra funds?

Solution:

The funds can be used to pay down the national debt or else be refunded to the taxpayers.

Exercise:

Problem:

Is it possible for a nation to run budget deficits and still have its debt/GDP ratio fall? Explain your answer. Is it possible for a nation to run budget surpluses and still have its debt/GDP ratio rise? Explain your answer.

Solution:

Yes, a nation can run budget deficits and see its debt/GDP ratio fall. In fact, this is not uncommon. If the deficit is small in a given year, then the addition to debt in the numerator of the debt/GDP ratio will be relatively small, while the growth in GDP is larger, and so the

debt/GDP ratio declines. It is also theoretically possible, although not likely, for a nation to have a budget surplus and see its debt/GDP ratio rise. Imagine the case of a nation with a small surplus, but in a recession year when the economy shrinks. It is possible that the decline in the nation's debt, in the numerator of the debt/GDP ratio, would be proportionally less than the fall in the size of GDP, so the debt/GDP ratio would rise.

Review Questions

Exercise:

Problem:

Give some examples of changes in national spending and taxes by the government that would be fiscal policy and some that would not.

Exercise:

Problem:

Have the spending and taxes of the South African government generally had an upward or a downward trend in the last few decades?

Exercise:

Problem:

What are the main categories of National government spending?

Exercise:

Problem:

What is the difference between a budget deficit, a balanced budget, and a budget surplus?

Exercise 8

A government starts off with a total debt of R3.5 billion. In year one, the government runs a deficit of R400 million. In year two, the government

runs a deficit of R1 billion. In year three, the government runs a surplus of R200 million. What is the total debt of the government at the end of year three?

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Glossary

balanced budget

when government spending and taxes are equal

budget deficit

when the federal government spends more money than it receives in taxes in a given year

budget surplus

when the government receives more money in taxes than it spends in a year

Taxation

By the end of this section, you will be able to:

- Differentiate among a regressive tax, a proportional tax, and a progressive tax
- Identify the major sources of revenue for the U.S. federal budget

Tax revenues are used to finance a wide variety of government purchases of goods and services and transfers to households and firms. Of course, income taxes, among other forms of taxes are not unique to South Africa; most other countries require their residents to pay various forms of taxes.

From the perspective of a household or a firm, the tax form is a statement of financial responsibility and liability. From the viewpoint of the government, taxes are instruments of fiscal policy and are based on the South African tax code. Changes in the country's tax code may have profound effects on the economy—both in the short run and in the long run.

In this section, we briefly review South Africa's tax structure and in particular the taxes that generate revenue for central government. In addition we examine some of the effects taxes may have on the economy. An understanding of taxes is vital for policy-makers who devise tax policies and for voters who elect them. Tax policies can be controversial since they may affect the economy in several different and often unintended ways. For example, South Africa's National Treasury is considering the imposition of a sugar tax. The aim of the tax is, firstly, to combat obesity by hiking prices of unhealthy beverages (encouraging consumers to choose healthier options), secondly, to boost state funds (Sugar tax will cost the South Africa economy R14 billion: 2016) Treasury estimates that the tax will add R11 billion to the fiscus.

The Beverages Association of South Africa (BevSA) has cautioned that the proposed sugar tax on sweetened beverages will cost the local economy R14 billion, and may push the country into recession (Sugar tax will cost the South African economy R14 billion: 2016). BevSA estimates that the proposed sugar-sweetened beverage tax could trigger between 62,000 to 72,000 job losses as a result of falling sales. The group argues, in addition,

that the tax would also further increase the burden on consumers with 25% price increases (up to 80% in some cases), and damage the competitiveness of the non-alcoholic beverage industry.

Politicians have argued about tax matters since the formation of modern states. Should government ensure it has enough tax revenue to balance its budget? How should it raise the revenues to fund its programs? What is the appropriate tax on the income received by individuals and corporations? Fiscal policy questions like these are debated in South Africa and other countries throughout the world. They are tough questions for politicians and economists alike.

Politicians focus mainly on who wins and loses—which groups will bear the burden of taxes and receive the benefits of government spending and transfers? They do so for political reasons and because one goal of a tax system is to **redistribute** income which is one of government's core functions in a mixed market economy. Economists, on the other hand, emphasize something rather different. Economists know that taxes are essential to finance government expenditures. At the same time, though, they are aware that taxes can have the negative effect of distorting people's decisions (choices) and lead to inefficiency. Remember that economics is really the study of peoples' **choices**. So economists are keen on designing tax systems that achieve the goals of raising revenue and redistributing income, without distorting the decisions (choices) of individuals and firms too much.

In addition, macro-economists know that taxes significantly affect overall economic performance, as measured by variables such as real gross domestic product (real GDP) growth or the unemployment rate. The government can use changes in taxes as a means of influencing aggregate spending (or aggregate demand) in the economy as proposed by John Maynard Keynes. In South Africa, central government - through the National Treasury - has often adjusted income taxes to affect overall economic performance. It is very important, therefore, that tax systems need to be thought through very carefully if they are to function efficiently. A good (efficient) tax system should raise revenue efficiently, redistribute income fairly (equitably) and not interfere/distort the choices/decisions of

individuals and firms (it should be neutral in its effect on economic activity).

Taxation in South Africa may include payments to a minimum of two different levels of government: central government through the South African Revenue Service (SARS) and/or to local government. Central government revenues derive mainly from income tax, value added tax (VAT), corporation tax and fuel duty. Local government revenues accrue primarily from municipal rates and grants and transfers from central government funds (Taxation in South Africa: 2016).

The Principles of Taxation

The quality of tax may be judged by three criteria. Firstly, it should be **efficient** or "**neutral**" in its effect on economic activity (that is, production, earning income and spending. Thus a tax should raise enough revenue such that government projects can be adequately sponsored, without burdening the economy too much (especially tax payers). Taxes should not act as a disincentive for performance (investment, earnings and savings). By this measure, South Africa's proposed sugar tax does not score highly given that it is expected to cause sales in the beverage industry to fall with consequent unemployment and loss of earnings.

Secondly, a good tax should be comprehensible to the average person. It should be easily **understandable** and administratively simple. Taxpayers need to appreciate **why** they are required to pay the tax, **how** to complete the tax assessment form, **how** the required tax amount is computed and **where** and to **whom** and **when** the tax is payable. A simple tax system is likely to result in lower administration and compliance costs for the government.

Thirdly, a good quality tax should be perceived by taxpayers to be **equitable (fair)** if government expects them to comply with the requirement to pay the tax. If people think that they are being treated unfairly in being forced to pay a tax they will surely feel that they are justified in finding ways not to pay the tax. This results in tax avoidance (finding ways to legally pay less tax) and tax evasion (using illegal means

to avoid paying such as simply not declaring income). Taxation should be governed by people's ability to pay, that is, wealthier individuals or firms with greater incomes should pay more in tax while those with lower incomes should pay comparatively less. The ability-to-pay principle of equity/fairness can be further refined into **horizontal** equity and **vertical** equity (Mohr: 2015). Horizontal equity requires that individuals with roughly the same means (income, wealth etc.) should be taxed at the same rate. Vertical equity requires that individuals at different income/wealth levels should be taxed at different rates (higher rates for those who earn more income or who are wealthier).

Alongside the **ability-to-pay principle** of fairness/equity is the **benefit principle** of taxation. The benefit principle proposes that those who use a publicly provided service (which is funded primarily through taxation) should pay for it! Which seems fair enough. However, the ability-to-pay principle may conflict with the benefit principle in some instances. Take, for example, state-funded healthcare which is meant to assist the poor. The poor cannot afford to pay for this service but they are the beneficiaries of it. The benefit principle requires them to pay for the service of state healthcare but the ability-to-pay principle requires them not to pay for it.

Tax Structures and Terms

Taxes are designed in different ways. They may be **direct** taxes or **indirect** taxes. They may be **progressive**, **proportional** or **regressive** in their income appropriation impacts. And they may be **general** or **selective**

Direct taxes are levied on individuals and entities or organizations. These types of taxes are generally levied on income and wealth. South African examples of these taxes include personal income tax, corporate (company) tax and estate duty. Taxes on goods and services or taxes on products and production, as opposed to taxes payable by legal entities such as individuals and companies, are termed **indirect** taxes. These taxes are levied on transactions and are indirectly paid by those who purchase the goods and services that attract this type of taxation. South African examples of these types of taxes include value added tax (VAT), and excise and customs duties.

With **proportional** taxes the percent or proportion of tax paid is always the same, although in absolute terms it increases the higher the taxable income. So if a low income earner is taxed at 20%, so is a high income earner. Obviously 20% of a higher income works out to more than 20% of a lower salary. In South Africa company tax (corporate income tax, CIT) is an example of a direct, proportional tax since the profits of all companies are taxed at a flat rate of 28% (South African Revenue Service: 2016).

In a **progressive** tax system/structure higher income earners pay a greater proportion or percent of their income in tax than low earners. Thus the ratio of tax paid to taxable income increases as taxable income increases. The rationale for this is to comply with the vertical equity (fairness) requirement of taxation, that is, those earning different amounts of income should be taxed differently. In other words, poorer people cannot fairly be taxed at the same rate as richer people. South Africa, like most other countries, has a progressive income tax system.

Regressive taxes are not **intentionally** employed by governments since they fail the important requirement that taxes must be perceived to be fair. Governments rely heavily on direct taxes (in addition to indirect taxes) but their disadvantage is that they tend to be regressive in how they affect income distribution. Regressive taxes mean that lower income earners pay a higher percent of their income in tax than high income earners. The ratio of tax paid to taxable income increases as income falls and decreases as income increases. This is of course morally unacceptable. Examples of regressive taxes in South Africa include Value Added Tax (VAT), fuel levies, customs duties and excise taxes.

General taxes are levied widely. Thus income tax in South Africa is an example of a general, direct tax since **all** income earners above a certain stipulated income threshold are required by law to pay income tax. VAT in South Africa is an example of a general, indirect tax since it is levied on all goods and services (barring those that are zero VAT rated or are exempt from VAT). **Selective** taxes are levied on specific goods and services. In South Africa **excise** duties are examples of selective taxes. Familiar excise duties in South Africa include those payable on any purchases of tobacco, alcohol and fuel.

The Main South African Taxes

Personal Income Tax

Individual income tax (or personal income tax, PIT) has traditionally been, and remains, South Africa's single biggest source of tax revenue (South Africa. National Treasury: 2016). The income taxes that individuals are expected to pay depend on their **taxable** income. Thus not all of an individual's income is taxable. Certain deductions and exemptions for tax purposes from gross income are allowed by the National Treasury. Some examples of these deductions from taxable income include employees' contributions of their gross income to their pension funds and medical aid schemes (up to a specified percent of gross income). Other income that would be deducted from employees' gross income for tax purposes includes annual service bonuses. In addition each income tax payer is entitled up to three tax rebates (refunds) depending on their age. Thus income tax payable is further reduced by tax rebates. Older tax payers are entitled to more tax rebates since their income earning capacity is smaller. Taxable income constitutes the country's **tax base** and is computed as follows:

$$\text{Taxable Income} = \text{Gross Income} - (\text{Deductions} + \text{Exemptions})$$

Personal income tax rates in South Africa range from 18% (for income below R188,000 p.a) to 41% (for amounts over R701,300), although the tax threshold of R75,000 (for persons below age 65) means that anyone earning less than this amount pays no income tax. Individuals earning less than R75,000 in the 2016/2017 financial year are not required to declare their income and do not need to submit an income tax return so long as their remuneration is from a single employer, their remuneration is for the full tax year and no allowance was paid, from which Pay-as-you-earn (PAYE) was not deducted including any travel allowance. PAYE is the income tax due on income paid by employers to their workers and which is estimated by them, deducted monthly and paid over to the South African Revenue Service.

The progressive nature of South Africa's personal income tax system can be observed in Table 1 which shows the individual income tax rates applicable in 2016/2017 in South Africa. Note that each tax bracket (or category)

specifies a **marginal** tax rate as well as a **basic** amount of tax that is payable (with the exception of those earning less than R188,000 who pay only the marginal rate of tax). The taxation principle of vertical equity is clearly displayed in the different basic and marginal taxes that apply to the different income brackets. At the same time the horizontal equity principle is also evident in that all income earners whose taxable incomes fall in the same income tax bracket pay the same basic and marginal tax.

[missing_resource: taxtable3.1.jpeg]**Table 1.** South Africa's income tax table, 2016/2017 (Source: adapted from South Africa. National Treasury: 2016)

The **marginal** tax rate is the additional/extra tax that is payable over and above the basic amount of tax that is due. Thus, for example, an income earner whose taxable income for the year is R200,000 will pay R33,840 basic tax + R3,119.74 marginal tax ($R200,000 - R188,001 = R11,999 \times 0.26 = R3,119.74$). In a progressive income tax system, such as South Africa's, the marginal rate of tax as well as the **average** rate of tax increase as taxable income increases. The average tax rate is the total value of tax paid as a percent of total taxable income and is also referred to as the **effective rate** of tax.

In the 2001/2002 financial year **Capital Gains Tax (CGT)** was introduced to discourage taxpayers from avoiding income tax by converting income into capital gains (Mohr, et al: 2015). Previously capital gains (profits on disposal of assets) were not taxed. South Africa's Income Tax Act of 1962 now requires that all capital gains and capital losses made on the disposal of assets are subject to CGT unless excluded by specific provisions (South African Revenue Service: 2015). So the idea is that people will not be tempted to trade in assets (properties, shares and other investments) to generate income in the form of profits (capital gains) which were not previously taxed. Now they are which means that people generating income from trading assets are treated just the same as people earning salaries and wages. For this reason CGT is regarded as an extension of income tax and is not really a separate tax.

Value Added Tax (VAT)

VAT remains government's second most important source of tax revenue after personal income taxes. While VAT scores highly on the tax quality scale of efficiency/neutrality in the sense that it does not unduly distort the choices/decisions people make, it is an indirect, regressive tax. Thus poorer people, although they pay the same rate of VAT on goods and services as richer people, end up paying a greater percent of their taxable income in VAT than richer people. A tax system that increases the tax burden as income decreases is morally and ethically questionable.

Value-added tax (VAT) was introduced in South Africa on 29th September 1991 to replace GST (General Sales Tax) as South Africa's primary indirect system of taxation (VAT: Value Added Tax: 2014). It is levied in terms of the Value-Added Tax Act 89 of 1991 which makes allowance for exemptions, exceptions, deductions and adjustments that effectively lower the VAT liability. This is in consideration of the regressive nature of VAT. VAT was initially levied in 1991 at a statutory rate of 10% of sales price. The rate was subsequently increased to 14% of sales price in 1993, and currently remains the same. However, tax experts have recommended to government that increasing the rate of VAT from 14% will be more efficient in terms of raising tax revenue than increasing personal income tax or company income tax (South Africans will not stand for VAT hike in 2016: 2016).

The basic characteristics of VAT are that it applies generally (it is a general tax) to transactions relating to goods and services (it is an indirect tax). VAT is levied at each stage of the production and distribution process at the rate of 14% as at 2016. Business owners may deduct tax paid during previous transactions relating to inputs used by their own operations, however the burden of the tax is passed on to the final consumer (VAT: Value Added Tax: 2014). To compensate for the regressive nature of VAT some goods and services are subject to a **zero rate** of VAT while others are **exempt** from VAT.

Goods and services that are zero rated in South Africa include 19 basic food items and illuminating paraffin. This is clearly a concession to the regressive nature of VAT. Other zero rated items include goods which are

subject to the fuel levy (petrol and diesel), international transport services, farming inputs, sales of going concerns and certain grants by government. Items that are exempt from VAT in South Africa include non-fee related financial services, educational services provided by an approved educational institution, residential rental accommodation, and public road and rail transport (Reaching for new heights: 2009).

Corporate Income Tax

Corporate Income Tax (CIT) is levied on companies resident in the Republic of South Africa (incorporated under the laws of, or which are effectively managed in, the Republic, and which derive income from within or outside the Republic). Non-resident companies which operate through a branch or which have a permanent establishment within South are also subject to tax on all income from any source within the country (South African Revenue Service: 2016). CIT is applicable (but not limited) to companies which are liable under the Income Tax Act, 1962 for the payment of tax on all income received by or accrued to them within a financial year. Typical South African company structures that are required to submit tax returns include, among others, listed and unlisted public companies, private companies, co-operatives and Close Corporations.

Corporate income tax generates the third most tax revenue for government after personal income tax and VAT. It is a direct, proportional tax which is levied at a flat rate of 28% in South Africa. In the case of proportional taxes the marginal and average rates of tax are the same.

Table 2 gives a breakdown of the anticipated contributions of the different taxes to total tax revenue in the 2016/2017 financial year.

[missing_resource: taxtable2.jpeg]**Table 2.**
Contribution of the different taxes to South
Africa's total expected tax revenue, 2016/2017
(Source: adapted from South Africa. National
Treasury: 2016)

Important Tax Considerations

A growing tax burden

Figure 2 illustrates the disparity between government spending and tax revenue from 1972 to 2014. Both government spending and tax revenue as a percent of GDP have generally trended upwards over time. Each year the gap between government spending and tax revenue to fund that spending adds to the country's national debt which, in the 2016/2017 financial year surpassed the R2 trillion mark or 50% of GDP (South Africa. National Treasury: 2016, South Africa government debt: 2016). Annual debt service costs are the fastest growing item of government consumption expenditure and account for 12c of every rand of state revenue (South Africa. National Treasury: 2016). The South African government accepts that the current level of state debt is not sustainable (Vollgraaf and Cohen: 2014). If government spending and debt continue on this relentlessly upward trajectory taxes will eventually have to be raised substantially.

[missing_resource: spendrev.jpg] **Figure 2.** Government expenditure and tax revenue as a percent of GDP, 1972-2014 (Source: adapted from World Bank: 2016a, World Bank: 2016b)

Who exactly pays the country's taxes?

South Africa's personal income tax base is relatively small. Out of a population of nearly 53 million in 2013 only 3.3 million are estimated to have paid 99% of all income tax in the 2012/2013 financial year (Hampton: 2013). At the same time the number of state grant recipients increased over four times between 2001 and 2012 (Jones: 2013). Thus in 2001, for every 100 people receiving social grants, 330 people had jobs. In 2012, for every 100 recipients of various types of social grant, only 90 people had jobs. It is simply not sustainable in the long term to have more **recipients** of state funding than **contributors** to state funds. Such a situation is likely to cause overburdened tax-payers to question the fairness of such a system. Once tax-payers begin to question the fairness of taxes they may feel justified in resisting the system. An example of this is the rejection by many South Africans of the Gauteng E-toll system.

Is tax compliance being undermined by careless and corrupt government?

Wastage of tax revenue by officials, theft of state funds and public sector corruption are all factors that further undermine the willingness of taxpayers to comply with the country's tax code. It has been estimated that R700 million was lost due to public sector corruption during the two decades following the dawn of democracy in 1994 (10 corruption scandals that rocked South Africa: 2015). It is feared that the actual amounts of tax revenue stolen are far higher but cannot be exactly determined because of the secretive nature of corruption.

[missing_resource: zapetoll.jpeg] **Figure 3.**
Stuff you Mr Taxman.

Over and above South Africa's arms deal concluded in 1999 and the irregular expenditure on upgrades to President Zuma's Nkandla home (which commenced in 2009), other major scandals involving abuse of tax revenue include local government being identified as the most corrupt level of government with extensive maladministration and mismanagement of public funds. Rampant "tenderpreneurship" has been uncovered in large sections of government along with pervasive bribery and corruption in the South African Police Service (10 corruption scandals that rocked South Africa: 2015). Among other concerns that were highlighted were the significant incidences of members of parliament and ministers lying about their qualifications and who have criminal records or who have been implicated in irregular and corrupt practices. Who would willingly pay tax to support this? A senior South African judge has warned of a tax revolt by South African citizens who are tiring of a seemingly increasingly corrupt regime (Lamprecht: 2016). Citizens have a responsibility to themselves and their children to hold government to account.

The Economic Consequences of Taxation

Taxation is not simply a matter of government imposing a tax and collecting the revenue. Taxes have to be carefully designed according to established criteria if they are to be successful. Public perceptions of unfair or heavy taxation along with mismanagement of tax revenue and corruption are

likely to undermine tax compliance. If citizens feel they are being disrespected by government they **will** find ways to pay less tax and government will consequently not be able to fund its important roles in a mixed market economy: allocating resources to the provision of public goods and services, redistributing income and economic stabilisation. This would be a pity.

Taxes have economic consequences in the sense that they will influence the choices/decisions that people make (recall that economics is really about choices and the consequences of choices). Two types of liability are associated with taxes. The first is the **statutory/legal** burden or liability/incidence of the tax. This refers to **who** is required by law to hand the tax due over to the Receiver of Revenue. The second type of liability/burden (incidence) associated with a tax is its **effective** incidence. Thus, **who** carries the **real** burden of the tax. Who ultimately paid the tax?

An example might clarify the difference between the two types of tax incidence. The statutory incidence of VAT, for example, in South Africa lies with sellers. Thus the Receiver of Revenue demands from sellers 14% of the sales price. However, the effective incidence of VAT is experienced by consumers since the VAT is passed on to them via a higher price by the amount of VAT. Consumers carry the real or effective burden of VAT. It is the **effective** incidence of a tax that determines its economic effect, that is, its effects on spending, production and income. So in the case of VAT, for example, an increase in VAT will first affect consumers who might consequently spend less and so firms' sales may ultimately suffer.

Key Concepts and Summary

Tax is a sensitive economic issue and generates much controversy. Efficient taxes need to be well designed according to the recognised tax principles of neutrality/efficiency, equity and administrative simplicity. South Africa's primary revenue generating taxes are personal income tax, corporate income tax and VAT. Other taxes include excise taxes on alcohol and tobacco, fuel, customs duties, and estate duty. A progressive tax is one, like personal income tax, where those with higher incomes pay a higher share of taxes out of their income than those with lower incomes. A proportional tax

is one, like South Africa's corporate income tax, where every firm pays the same share of taxes regardless of profit level. A regressive tax is one, like VAT or any of the excise taxes, where those with high income pay a lower share of income in taxes than those with lower incomes. The economic consequences of a tax will be determined by its effective incidence.

Self-Check Questions

Exercise:

Problem:

Suppose that gifts were taxed at a rate of 10% for amounts up to R100,000 and 20% for anything over that amount. Would this tax be regressive or progressive?

Solution:

Progressive. People who give larger gifts subject to the higher tax rate would typically have larger incomes as well.

Exercise:

Problem:

If an individual owns a company of which he is the only employee, which different types of tax will he have to pay?

Solution:

Corporate income tax on his profits and personal income tax on his salary (including PAYE).

Exercise:

Problem:

What taxes would an individual pay if he were self-employed as a sole proprietor (not a company)?

Solution:

Individual income taxes

Exercise:**Problem:**

Both rich and poor pay a fuel levy of 154 cents/litre of petrol. Is this tax progressive, regressive or proportional?

Solution:

The tax is regressive because 154 cents/litre is a smaller percent of a rich person's income than a poorer person's income.

Review Questions

Exercise:

Problem: What are South Africa's main revenue generating taxes?

Exercise:**Problem:**

What is the difference between a progressive tax, a proportional tax, and a regressive tax?

Critical Thinking Questions

Exercise:**Problem:**

Excise taxes on fuel, tobacco, alcohol and VAT are often criticized for being regressive. Although everyone pays the same rate regardless of income, why might this be so?

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Glossary

corporate income tax

a tax imposed on corporate profits

estate and gift tax

a tax on people who pass assets to the next generation—either after death or during life in the form of gifts

excise tax

a tax on a specific good—on gasoline, tobacco, and alcohol

individual income tax

a tax based on the income, of all forms, received by individuals

marginal tax rates

or the tax that must be paid on all yearly income

payroll tax

a tax based on the pay received from employers; the taxes provide funds for Social Security and Medicare

progressive tax

a tax that collects a greater share of income from those with high incomes than from those with lower incomes

proportional tax

a tax that is a flat percentage of income earned, regardless of level of income

regressive tax

a tax in which people with higher incomes pay a smaller share of their income in tax

Introduction to Money and Banking

class="introduction"



Figure 1: Is this an image of a cowrie shell or money? The answer is: Both. For centuries, the extremely durable cowrie shell was used as a medium of exchange in various parts of the world. (Credit: modification of work by "prilfish"/Flickr Creative Commons)

Note:

The Many Disguises of Money: From Cowries to Bitcoins

Here is a general knowledge question: In the history of the world, what item was used for money over the broadest geographic area and for the

longest period of time? The answer is not gold, silver, or any precious metal. It is the cowrie, a mollusk shell found mainly off the Maldives Islands in the Indian Ocean. Cowries served as money as early as 700 B.C. in China. By the 1500s, they were in widespread use across India and Africa. For several centuries after that, cowries were used in markets including southern Europe, western Africa, India, and China for a wide range of purchases: everything from buying a meal or a ferry ride to paying for a shipload of silk or rice. Cowries were still acceptable as a way of paying taxes in certain African nations in the early twentieth century. To appreciate why cowrie shells came to be regarded as so valuable as to be acceptable as a form of money, try to find cowrie shells on any of South Africa's or even the world's beaches even today.

What made cowries work so well as money? First, they are extremely durable—lasting a century or more. As the late economic historian Karl Polanyi put it, they can be “poured, sacked, shoveled, hoarded in heaps” while remaining “clean, dainty, stainless, polished, and milk-white.” Second, parties could use cowries either by counting shells of a certain size, or—for large purchases—by measuring the weight or volume of the total shells to be exchanged. Third, it was impossible to counterfeit a cowrie shell, but gold or silver coins could be counterfeited by making copies with cheaper metals. Finally, in the heyday of cowrie money, from the 1500s into the 1800s, the collection of cowries was tightly controlled, first by the Portuguese and later by the Dutch and the English. As a result, the supply of cowries was allowed to grow quickly enough to serve the needs of commerce, but not so quickly that they were no longer scarce. Money throughout the ages has taken many different forms and continues to evolve even today. What do you think money is?

Note:**Introduction to Money and Banking**

In this chapter, you will learn about:

- Defining Money by Its Functions
- Measuring Money: Currency, M1, M2 and M3
- The Role of Banks

- How Banks Create Money

The discussion of money and banking is a central component in the study of macroeconomics. At this point, you should have firmly in mind the main goals of macroeconomics: economic growth, low unemployment, and low inflation. We have yet to discuss money and its role in helping to achieve our macroeconomic goals.

You should also understand Keynesian and neoclassical frameworks for macroeconomic analysis and how these frameworks can be embodied in the aggregate demand/aggregate supply (AD/AS) model. With the goals and frameworks for macroeconomic analysis in mind, the final step is to discuss the two main categories of macroeconomic policy: monetary policy, which focuses on money, banking and interest rates; and fiscal policy, which focuses on government spending, taxes, and borrowing. This chapter discusses what economists mean by money, and how money is closely interrelated with the banking system.

Defining Money by Its Functions

By the end of this section, you will be able to:

- Explain the various functions of money
- Contrast commodity money and fiat money

Money for the sake of money is not an end in itself. You cannot eat Rand notes or coins or wear your bank account. Ultimately, the usefulness of money rests in exchanging it for goods or services. As the American writer and humorist Ambrose Bierce (1842–1914) wrote in 1911, money is a “blessing that is of no advantage to us excepting when we part with it.” Money is what people regularly use when purchasing or selling goods and services, and thus money must be widely accepted by both buyers and sellers. This concept of money is intentionally flexible, because money has taken a wide variety of forms in different cultures.

Barter and the Double Coincidence of Wants

To understand the usefulness of money, we must consider what the world would be like without money. How would people exchange goods and services? Economies without money typically engage in the barter system. **Barter**—literally trading one good or service for another—is highly inefficient for trying to coordinate the trades in a modern advanced economy. In an economy without money, an exchange between two people would involve a **double coincidence of wants**, a situation in which two people each want some good or service that the other person can provide. For example, if an accountant wants a pair of shoes, this accountant must find someone who has a pair of shoes in the correct size and who is willing to exchange the shoes for some hours of accounting services. Such a trade is likely to be difficult to arrange. Think about the complexity of such trades in a modern economy, with its extensive division of labor that involves thousands upon thousands of different jobs and goods.

Another problem with the barter system is that it does not allow us to easily enter into future contracts for the purchase of many goods and services. For example, if the goods are perishable it may be difficult to exchange them

for other goods in the future. Imagine a farmer wanting to buy a tractor in six months using a fresh crop of strawberries. Of course the strawberries will not keep very well! Additionally, while the barter system might work adequately in small economies, it will keep these economies from growing. The time that individuals would otherwise spend producing goods and services and enjoying leisure time is spent bartering.

Functions of Money

Money solves the problems created by the barter system. (We will get to its definition soon.) First, money serves as a **medium of exchange**, which means that money acts as an intermediary between the buyer and the seller. Instead of exchanging accounting services for shoes, the accountant now exchanges accounting services for money. This money is then used to buy shoes. To serve as a medium of exchange, money must be very widely accepted as a method of payment in the markets for goods, labor, and financial capital.

Second, money must serve as a **store of value**. In a barter system, we saw the example of the shoemaker trading shoes for accounting services. But she risks having her shoes go out of style, especially if she keeps them in a warehouse for future use—their value will decrease with each season. Shoes are not a good store of value. Holding money is a much easier way of storing value. You know that you do not need to spend it immediately because it will still hold its value the next day, or the next year. This function of money does not require that money is a *perfect* store of value. In an economy with inflation, money loses some buying power (real value) each year, but it remains a store of value.

Third, money serves as a **unit of account**, which means that it is the ruler (metric) by which other values are measured. For example, an accountant may charge R200 to file your tax return. That R200 could also purchase two shirts at R100/shirt. Money acts as a common denominator, an accounting method that simplifies thinking about trade-offs. So the invention of money is great because it helps people to make choices by valuing the opportunity costs of these choices in money terms.

Finally, another function of money is that money must serve as a **standard of deferred payment**. This means that if money is usable today to make purchases, it must also be acceptable to make purchases today that will be paid in the *future*. Loans and future agreements (such as pensions and insurance payouts) are stated in monetary terms and the standard of deferred payment is what allows us to buy goods and services today and pay (or **be** paid) in the future. So **money** serves all of these functions— it is a medium of exchange, store of value, unit of account, and standard of deferred payment.

Commodity versus Fiat Money

Money has taken a wide variety of forms in different cultures. Gold, silver, cowrie shells, cigarettes, and even cocoa beans have been used as money. Although these items are used as **commodity money**, they also have a value from use as something other than money. Gold, for example, has been used throughout the ages as money although today it is not used as money but rather is valued for its other attributes. Gold is a good conductor of electricity and is used in the electronics and aerospace industry. Gold is also used in the manufacturing of energy efficient reflective glass for skyscrapers and is used in the medical industry as well. Of course, gold also has value because of its beauty and malleability in the creation of jewelry.

As commodity money, gold has historically served its purpose as a medium of exchange, a store of value, and as a unit of account. **Commodity-backed currencies** are currencies with values backed up by gold or another commodity held at a bank. The gold standard, for instance, was a commitment by participating countries to fix the values (prices) of their currencies in terms of a specified amount of gold (Bordo: 2008). Under this arrangement national money (including bank/demand deposits) was freely converted into gold at the fixed price. From 1880-1914 most countries adhered to the gold standard. However, the gold standard gradually started breaking down from the start of World War 1 and was finally discontinued in 1931. Today, in the modern era, currencies such as the Rand are no longer "backed" by commodities such as precious metals (including gold).



Figure 1 Today, South African Rands are backed by the South African Reserve Bank, but only as fiat money, not commodity money. (Credit: van der Merwe: 2016)

As economies grew and became more global in nature, the use of commodity monies became more cumbersome. Countries moved towards the use of **fiat money**. Fiat money has no intrinsic value, but is declared by a government to be the **legal tender** of a country. In other words, by government decree, if you owe a debt in South Africa, then legally speaking, you can pay that debt with South African Rands (ZAR), even though it is not backed by a commodity. The only backing of our money is universal faith and trust that the currency has value, and nothing more.

Note:

Check out this [South African Reserve Bank link](#) on the history of South African banknotes.



Key Concepts and Summary

Money is what people in a society regularly use when purchasing or selling goods and services. If money were not available, people would need to barter with each other, meaning that each person would need to identify others with whom they have a double coincidence of wants—that is, each party has a specific good or service that the other desires. Money serves several functions: a medium of exchange, a unit of account, a store of value, and a standard of deferred payment. There are two types of money: commodity money, which is an item used as money, but which also has value from its use as something other than money; and fiat money, which has no intrinsic value, but is declared by a government to be the legal tender of a country.

Self-Check Questions

Exercise:

Problem:

In many casinos, a person buys chips to use for gambling. Within the walls of the casino, these chips can often be used to buy food and drink or even a hotel room. Do chips in a gambling casino serve all three functions of money?

Solution:

As long as you remain within the walls of the casino, chips fit the definition of money; that is, they serve as a medium of exchange, a unit of account, and a store of value. Chips do not work very well as money once you leave the casino, but many kinds of money do not work well in other areas. For example, it is hard to spend money from China or Zambia at your local supermarket or at the movie theater.

Exercise:

Problem:

Can you name some item that is a store of value, but does not serve the other functions of money?

Solution:

Many physical items that a person buys at one time but may sell at another time can serve as an answer to this question. Examples include a house, land, art, rare coins or stamps, and so on.

Review Questions

Exercise:

Problem: What are the four functions served by money?

Exercise:

Problem:

How does the existence of money simplify the process of buying and selling?

Exercise:

Problem: What is the double-coincidence of wants?

Critical Thinking Questions

Exercise:

Problem:

Although cowrie shells are no longer used as money, do you think other forms of commodity monies are possible? What role might technology play in our definition of money?

Exercise:

Problem:

Imagine that you are a barber in a world without money. Explain why it would be tricky to obtain groceries, clothing, and a place to live.

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Glossary

barter

literally, trading one good or service for another, without using money

commodity money

an item that is used as money, but which also has value from its use as something other than money

commodity-backed currencies

are dollar bills or other currencies with values backed up by gold or another commodity

double coincidence of wants

a situation in which two people each want some good or service that the other person can provide

fiat money

has no intrinsic value, but is declared by a government to be the legal tender of a country

medium of exchange

whatever is widely accepted as a method of payment

money

whatever serves society in four functions: as a medium of exchange, a store of value, a unit of account, and a standard of deferred payment.

standard of deferred payment

money must also be acceptable to make purchases today that will be paid in the future

store of value

something that serves as a way of preserving economic value that can be spent or consumed in the future

unit of account

the common way in which market values are measured in an economy

Measuring Money: Currency, M1, and M2

By the end of this section, you will be able to:

- Contrast M1 money supply and M2 money supply
- Classify monies as M1 money supply or M2 money supply

Cash in your pocket certainly serves as money. But what about checks or credit cards? Are they money, too? Rather than trying to state a single way of measuring money, economists offer broader definitions of money based on liquidity. Liquidity refers to how quickly a financial asset can be used to buy a good or service. For example, cash is very liquid. Your R100 note can be easily used to buy a big hamburger and chips at lunchtime and a good amount of airtime. However, R100 that you have in your savings account is not so easy to use. You must first go to the bank or ATM machine and withdraw that cash to do your purchases. Thus, R100 in your savings account is *less* liquid than cash in your wallet.

The South African Reserve Bank, which is South Africa's central bank, is a bank regulator and is responsible for monetary policy and defines money according to its liquidity. South Africa has three broad definitions of money: M1, M2 and M3 money supply. **M1 money supply** includes those monies that are very liquid such as coins and notes (that is, cash in circulation outside the monetary sector) as well as checkable and transmission (demand) deposits of the domestic private sector with monetary institutions (Mohr: 2015).

Thus **M1 money supply** includes **coins and currency in circulation**—the coins and bank notes that circulate in an economy that are not held by the monetary sector. The reason for this is that only monies in the hands of the public can be used as a means of payment (medium of exchange function of money). The monetary sector in South Africa includes the South African Reserve Bank, the Corporation for Public Deposits, the Land Bank, Postbank, private banking institutions and mutual building societies (Mohr: 2015).

Closely related to currency are checkable deposits, also known as **demand deposits**. These are the amounts held in checking accounts. They are called

demand deposits or checkable deposits because the banking institution must give the deposit holder his money “on demand” when a check is written or a debit card is used. These items together—currency, and checking accounts in banks—make up the definition of money known as M1.

M1 is the supply of money category that serves as a "medium of exchange". M1, as a supply of money (M) can be expressed as an identity:

$$M = C + D$$

M = Supply (quantity) of money, C = coins and banknotes (cash in circulation outside the monetary sector), D = demand deposits. Demand deposits constitute a much greater percent of M1 than cash as illustrated in Table 1.

[missing_resource: cashtable.jpeg]**Table 1**
South Africa's M1 money supply, 2016 (Source:
South African Reserve Bank: 2016)

M2 money supply is less liquid in nature and includes M1 plus all other short-term and medium-term deposits of the domestic private sector with monetary institutions (Mohr: 2015). It is thus a broader definition of money than M1. Short-term (less than 30 days) and medium-term notice deposits (30 days to 6 months) are not immediately available to serve the medium of exchange function of money.

M3 money supply is the broadest definition of money supply and is equal to M2 as well as all long-term deposits of the domestic private sector with monetary institutions (Mohr: 2015). Long term notice deposits have a maturity of more than 6 months. Because M3 is the most comprehensive measure of the country's aggregate money supply, it includes not only the "medium of exchange" (liquid) categories of money but also its "store of value" categories of monies. Figure 1 illustrates that M1 and M2 money supplies are subsets of the total supply of money, M3.

[missing_resource: moneymeasure.jpeg]**Figure**

1 The money supply

The lines separating M1, M2 and M3 can become a little blurry. Sometimes elements of M1 are not treated alike; for example, some businesses will not accept personal checks for large amounts, but will accept electronic funds transfers (EFT's) or cash. Changes in banking practices and technology have made the savings accounts in M2 and M3 more similar to the checking accounts in M1. For example, some savings accounts will allow depositors to write checks, use automatic teller machines, and pay bills over the Internet, which has made it easier to access savings accounts. As with many other economic terms and statistics, the important point is to know the strengths and limitations of the various definitions of money, not to believe that such definitions are as clear-cut to economists as, say, the definition of nitrogen is to chemists.

Where does “plastic money” like debit cards, credit cards, and smart money fit into this picture? A **debit card**, like a check, is an instruction to the user’s bank to transfer money directly and immediately from your bank account to the seller. It is important to note that in our definition of money, it is *checkable deposits* that are money, not the paper check or the debit card. Although you can make a purchase with a **credit card**, it is not considered money but rather a short term loan from the credit card company to you. When you make a purchase with a credit card, the credit card company immediately transfers money from its checking account to the seller, and at the end of the month, the credit card company sends you a bill for what you have charged that month. Until you pay the credit card bill, you have effectively borrowed money from the credit card company. With a **smart card**, you can store a certain value of money on the card and then use the card to make purchases. Some “smart cards” used for specific purposes, like long-distance phone calls or making purchases at specific outlets/shops, are not really all that smart, because they can only be used for certain purchases or in certain places.

In short, credit cards, debit cards, and smart cards are different ways to move money when a purchase is made. But having more credit cards or debit cards does not change the quantity of money in the economy, any

more than having more checks printed increases the amount of money in your checking account.

One key message underlying this discussion of the different measures of money in a modern economy is that money is not just banknotes and coins; instead, money is closely linked to bank accounts. Indeed, the macroeconomic policies concerning money are largely conducted through the banking system. The next section explains how banks function and how a nation's banking system has the power to "create" money.

Key Concepts and Summary

Money is measured with several definitions: M1 includes currency and money in checking accounts (demand deposits) and serves the "medium of exchange" function of money. M2 includes all of M1, plus short- and medium-term savings notice deposits and money market funds. M3 includes M2 plus all long-term savings notice deposits. M3 is thus the total supply of money and includes not only the medium of exchange categories of money but also the "store of value" forms of money.

Self-Check Questions

Exercise:

Problem:

If you are out shopping for clothes and books, what is easiest and most convenient for you to spend: M1, M2 or M3? Explain your answer.

Solution:

The currency and checks in M1 are easiest to spend. It is harder to spend M2 and M3 directly, although if there is an automatic teller machine in the shopping mall, you could possibly turn M2 from your savings account into an M1 of currency quite quickly. If your answer is about "credit cards," then you are really talking about spending M1—

although it is M1 from the account of the credit card company, which you will repay later when your credit card bill becomes due.

Exercise:

Problem:

For the following list of items, indicate if they are in M1, M2, M3 or none of the categories:

- a. Your R5,000 ABSA overdraft
- b. R500 Mr Price voucher you have not used yet
- c. R10 change in your pocket
- d. R12,000 in your checking account
- e. R20,000 you have in a money market account

Solution:

- a. Not in M1, M2 or M3
- b. That is part of M1, and because M2 includes M1 it is also part of M2
- c. Currency out in the public hands is part of M1
- d. Checking deposits are in M1
- e. Money market accounts are in M2

Review Questions

Exercise:

Problem: What components of money are counted as part of M1?

Exercise:

Problem: What components of money are counted in M3?

Critical Thinking Questions

Exercise:

Problem:

Explain why you think the Reserve Bank is especially interested in M3.

Exercise:

Problem:

If you take R1000 out of your piggy bank and deposit it in your checking account, how did M1 change? Did M2 change?

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Glossary

coins and currency in circulation

the coins and bills that circulate in an economy that are not held by the U.S Treasury, at the Federal Reserve Bank, or in bank vaults

credit card

immediately transfers money from the credit card company's checking account to the seller, and at the end of the month the user owes the money to the credit card company; a credit card is a short-term loan

debit card

like a check, is an instruction to the user's bank to transfer money directly and immediately from your bank account to the seller

demand deposit

checkable deposit in banks that is available by making a cash withdrawal or writing a check

M1 money supply

a narrow definition of the money supply that includes currency and checking accounts in banks, and to a lesser degree, traveler's checks.

M2 money supply

a definition of the money supply that includes everything in M1, but also adds savings deposits, money market funds, and certificates of deposit

money market fund

the deposits of many investors are pooled together and invested in a safe way like short-term government bonds

savings deposit

bank account where you cannot withdraw money by writing a check, but can withdraw the money at a bank—or can transfer it easily to a checking account

smart card

stores a certain value of money on a card and then the card can be used to make purchases

time deposit

account that the depositor has committed to leaving in the bank for a certain period of time, in exchange for a higher rate of interest; also called certificate of deposit

The Role of Banks

By the end of this section, you will be able to:

- Explain how banks act as intermediaries between savers and borrowers
- Evaluate the relationship between banks, savings and loans, and credit unions
- Analyze the causes of bankruptcy and recessions

The late bank robber named Willie Sutton was once asked why he robbed banks. He answered: “That’s where the money is.” While this may have been true at one time, from the perspective of modern economists, Sutton is both right and wrong. He is wrong because the overwhelming majority of money in the economy is not in the form of currency sitting in vaults or drawers at banks, waiting for a robber to appear. Most money is in the form of bank accounts, which exist only as electronic records on computers. From a broader perspective, however, the bank robber was more right than he may have known. Banking is intimately interconnected with money and consequently, with the broader economy.

Banks make it far easier for a complex economy to carry out the extraordinary range of transactions that occur in goods, labor, and financial markets. Imagine for a moment what the economy would be like if all payments had to be made in cash. When shopping for a large purchase or going on vacation you might need to carry hundreds of Rands in a pocket or purse. Even small businesses would need stockpiles of cash to pay workers and to purchase supplies. A bank allows people and businesses to store this money in either a checking account or savings account, for example, and then withdraw this money as needed through the use of a direct withdrawal, writing a check, by electronic funds transfer (EFT) or using a debit or credit card.

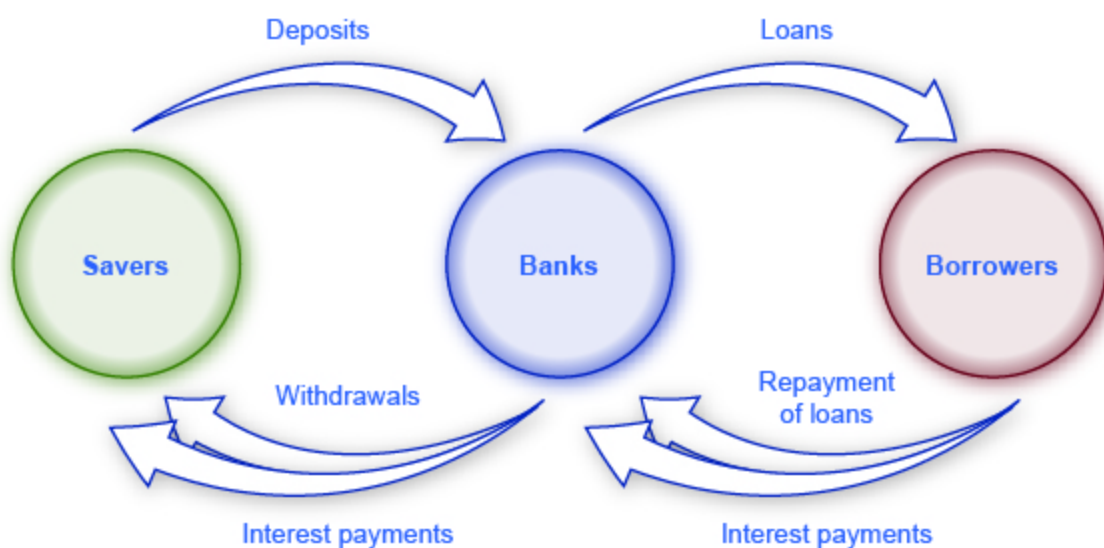
Banks are a critical intermediary in what is called the **payment system**, which helps an economy exchange goods and services for money or other financial assets. Also, those with extra money that they would like to save can store their money in a bank rather than look for an individual that is willing to borrow it from them and then repay them at a later date. Those who want to borrow money can go directly to a bank rather than trying to

find someone to lend them cash. **Transaction costs** are the costs associated with finding a lender or a borrower for this money. Thus, banks lower transactions costs and act as financial intermediaries—they bring savers and borrowers together. Along with making transactions much safer and easier, banks also play a key role in the creation of money.

Banks as Financial Intermediaries

An “intermediary” is one who stands between two other parties. Banks are a **financial intermediary**—that is, an institution that operates between a saver who deposits money in a bank and a borrower who receives a loan from that bank. Financial intermediaries include other institutions in the financial market such as insurance companies and pension funds, but they will not be included in this discussion because they are not considered to be **depository institutions**, which are institutions that accept money *deposits* and then use these to make loans. All the funds deposited are mingled in one big pool, which is then loaned out. Figure 1 illustrates the position of banks as financial intermediaries, with deposits flowing into a bank and loans flowing out. Of course, when banks make loans to firms, the banks will try to funnel financial capital to healthy businesses that have good prospects for repaying the loans, not to firms that are suffering losses and may be unable to repay.

Banks as Financial Intermediaries



Banks act as financial intermediaries because they stand between savers and borrowers. Savers place deposits with banks, and then receive interest payments and withdraw money. Borrowers receive loans from banks and repay the loans with interest. In turn, banks return money to savers in the form of withdrawals, which also include interest payments from banks to savers.

Note:

How are financial intermediaries related?

Banks have a couple of close cousins: besides locally controlled banks there are also foreign controlled banks, mutual banks, the Land and Agricultural Bank of South Africa, the Development Bank of Southern Africa, Postbank and savings and credit co-operatives (SACCO's). In the next chapter we discuss South Africa's central bank, the Reserve Bank. Banks, as explained, receive deposits from individuals and businesses and make loans with the money. Savings institutions are also sometimes called "savings and loans" or "thrifts."

A credit co-operative or union is a formally registered financial institution that its members own and run. Members of each credit union decide who is eligible to be a member. Usually, potential members would be everyone in a certain community, or groups of employees, or members of a certain organization. The credit union accepts deposits from members and focuses on making loans back to its members. Informal financial intermediaries include stokvels and savings clubs which operate on the same basis as formally registered credit co-operatives although on a smaller scale (up to 12 members). Omarjee (2016) notes that 42% of South Africans depend on stokvels as a savings tool. The choice of using informal as opposed to formally registered financial intermediaries has, logically enough, been termed "**disintermediation**".

A Bank's Balance Sheet

A **balance sheet** is an accounting tool that lists assets and liabilities. An **asset** is something of value that is owned and can be used to produce something. For example, the cash you own can be used to pay your tuition. If you own a home, this is also considered an asset. A **liability** is a debt or something you owe. Many people borrow money to buy homes. In this case, a home is the asset, but the mortgage (or bond) is the liability. The **net worth** is the asset value minus how much is owed (the liability). A bank's balance sheet operates in much the same way. A bank's net worth is also referred to as **bank capital**. A bank has assets such as cash held in its vaults, monies that the bank holds at the Reserve bank (called "reserves"), loans that are made to customers, and bonds.

Figure 2 illustrates a hypothetical and simplified balance sheet for the imaginary Safe and Secure Bank. Because of the two-column format of the balance sheet, with the T-shape formed by the vertical line down the middle and the horizontal line under "Assets" and "Liabilities," it is sometimes called a **T-account**.

Assets		Net Worth + Liabilities	
Reserves	R2 million	Deposits	R10 million
Loans	R4 million	Net Worth	R1 million
SA Government bonds	R5 million		

Figure 2 Simplified T-account balance sheet

The "T" in a T-account separates the assets of a firm, on the left, from its liabilities, on the right. All firms use T-accounts, though most are much more complex. For a bank, the assets are the financial instruments that either the bank is holding (its reserves) or those instruments where other parties owe money to the bank—like loans made by the bank and Government Securities, such as South African treasury bonds purchased by the bank. Liabilities are what the bank owes to others. Specifically, the bank owes any deposits made in the bank to those who have made them. The net worth of the bank is the total assets minus total liabilities. Net worth is included on the liabilities side to have the T account balance to zero. For a

healthy business, net worth will be positive. For a bankrupt firm, net worth will be negative. In either case, on a bank's T-account, assets will always equal liabilities plus net worth.

When bank customers deposit money into a checking account, savings account, or money market/fixed deposit accounts, the bank views these deposits as liabilities. After all, the bank owes these deposits to its customers, when the customers wish to withdraw their money. In the example shown in Figure 2, the Safe and Secure Bank holds R10 million in deposits.

Loans are the first category of bank assets shown in Figure 2. Say that a family takes out a 30-year mortgage loan (bond) to purchase a house, which means that the borrower will repay the loan over the next 30 years. This loan is clearly an asset from the bank's perspective, because the borrower has a legal obligation to make payments to the bank over time. But in practical terms, how can the value of the mortgage loan that is being paid over 30 years be measured in the present? One way of measuring the value of something—whether a loan or anything else—is by estimating what another party in the market is willing to pay for it. Many banks issue home loans, and charge various handling and processing fees for doing so, but then sell the loans to other banks or financial institutions who collect the loan payments. The market where loans are made to borrowers is called the primary loan market, while the market in which these loans are bought and sold by financial institutions is the secondary loan market.

One key factor that affects what financial institutions are willing to pay for a loan, when they buy it in the secondary loan market, is the perceived riskiness of the loan: that is, given the characteristics of the borrower, such as income level and whether the local economy is performing strongly, what proportion of loans of this type will be repaid? The greater the risk that a loan will not be repaid, the less that any financial institution will pay to acquire the loan. Another key factor is to compare the interest rate charged on the original loan with the current interest rate in the economy. If the original loan made at some point in the past requires the borrower to pay a low interest rate, but current interest rates are relatively high, then a financial institution will pay less to acquire the loan. In contrast, if the

original loan requires the borrower to pay a high interest rate, while current interest rates are relatively low, then a financial institution will pay more to acquire the loan. For the Safe and Secure Bank in this example, the total value of its loans if they were sold to other financial institutions in the secondary market is R5 million.

The second category of bank asset is bonds, which are a common mechanism for borrowing, used by government, private companies, and even non-profit organizations. A bank takes some of the money it has received in deposits and uses the money to buy bonds—typically bonds issued by the South African government. Government bonds are generally regarded to be low-risk because the government is virtually certain to pay off the bond, albeit at a relatively low rate of interest. These bonds are an asset for banks in the same way that loans are an asset: The bank will receive a stream of payments in the future in the form of the **coupon** or **interest rate**. In our example, the Safe and Secure Bank holds bonds worth a total value of R4 million.

Note:

What are "Bonds"?

In finance, a **bond** is an instrument of indebtedness of the bond issuer to the holders. The most common types of bonds include those issued by governments (including municipalities) and companies (corporate bonds). A bond is a debt security, under which the issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay them interest (the coupon) and/or to repay the principal at a later date, termed the maturity date. Interest is generally payable at fixed intervals (semi-annually, annual or monthly). Bonds are generally negotiable which means that they can be traded in the secondary market. So a bond is a form of loan or IOU: the holder of the bond is the lender (creditor), the issuer of the bond is the borrower (debtor), and the coupon is the interest. Bonds provide the borrower with borrowed funds to finance long-term investments, or, in the case of government bonds, to finance current expenditure (Bond (Finance): 2016).

The final entry under assets is **reserves**, which is money that the bank keeps on hand, and that is not loaned out or invested in bonds—and thus does not lead to interest payments. The South African Reserve Bank requires that banks keep a certain percentage of depositors' money on “reserve,” which means either in their vaults or kept at the Reserve Bank. This is called a **reserve requirement**. The chapter on Monetary Policy and Bank Regulation will explain how the level of these required reserves are one policy tool used to influence bank behavior. Additionally, banks may also want to keep a certain amount of reserves on hand in excess of what is required. The Safe and Secure Bank is holding R2 million in reserves.

The net worth of a bank is defined as its total assets minus its total liabilities. For the Safe and Secure Bank shown in Figure 2, net worth is equal to R1 million; that is, R11 million in assets minus R10 million in liabilities. For a financially healthy bank, the net worth will be positive. If a bank has negative net worth and depositors tried to withdraw their money, the bank would not be able to give all depositors their money.

How Banks Go Bankrupt

A bank that is bankrupt will have a negative net worth, meaning its assets will be worth less than its liabilities. How can this happen? Again, looking at the balance sheet helps to explain.

A well-run bank will assume that a small percentage of borrowers will not repay their loans on time, or at all, and factor these missing payments into its planning. Remember, the calculations of the expenses of banks every year includes a factor for loans that are not repaid, and the value of a bank's loans on its balance sheet assumes a certain level of riskiness because some loans will not be repaid. Even if a bank expects a certain number of loan defaults, it will suffer if the number of loan defaults is much greater than expected, as can happen during a recession. For example, if the Safe and Secure Bank in Figure 2 experienced a wave of unexpected defaults, so that its loans declined in value from R5 million to R3 million, then the assets of the Safe and Secure Bank would decline so that the bank had negative net worth.

Note:

What led to the financial crisis of 2008–2009?

South Africa's economy, along with those of many other countries, was negatively affected by the Great Financial Crisis which was sparked off in 2008-2009 in the U.S.A. Many banks make mortgage loans so that people can buy a home, but then do not keep the loans on their books as an asset. Instead, the bank sells the loan in the secondary loan market. These loans are “securitized,” which means that they are bundled together into a financial security that is sold to investors. Investors in these mortgage-backed securities receive a rate of return based on the level of payments that people make on all the mortgages that stand behind the security.

Securitization offers certain advantages. If a bank makes most of its loans in a local area, then the bank may be financially vulnerable if the local economy declines, so that many people are unable to make their payments. But if a bank sells its local loans, and then buys a mortgage-backed security based on home loans in many parts of the country, it can avoid being exposed to local financial risks. (In the simple example in the text, banks just own “bonds.” In reality, banks can own a number of financial instruments, as long as these financial investments are safe enough to satisfy the government bank regulators.) From the standpoint of a local homebuyer, securitization offers the benefit that a local bank does not need to have lots of extra funds to make a loan, because the bank is only planning to hold that loan for a short time, before selling the loan so that it can be pooled into a financial security.

But securitization also offers one potentially large disadvantage. If a bank is going to hold a mortgage loan as an asset, the bank has an incentive to scrutinize the borrower carefully to ensure that the loan is likely to be repaid. However, a bank that is going to sell the loan may be less careful in making the loan in the first place. The bank will be more willing to make what are called “subprime loans,” which are loans that have characteristics like low or zero down-payment, little scrutiny of whether the borrower has a reliable income, and sometimes low payments for the first year or two that will be followed by much higher payments after that. Some subprime loans made in the mid-2000s were later called NINJA loans: loans made even though the borrower had demonstrated No Income, No Job, or Assets. In other words, reckless loans.

These subprime loans were typically sold and turned into financial securities—but with a twist. The idea was that if losses occurred on these mortgage-backed securities, certain investors would agree to take the first, say, 5% of such losses. Other investors would agree to take, say, the next 5% of losses. By this approach, still other investors would not need to take any losses unless these mortgage-backed financial securities lost 25% or 30% or more of their total value. These complex securities, along with other economic factors, encouraged a large expansion of subprime loans in the mid-2000s.

The economic stage was now set for a banking crisis. Banks thought they were buying only ultra-safe securities, because even though the securities were ultimately backed by risky subprime mortgages, the banks only invested in the part of those securities where they were protected from small or moderate levels of losses. But as housing prices fell after 2007, and the deepening recession made it harder for many people to make their mortgage payments, many banks found that their mortgage-backed financial assets could end up being worth much less than they had expected—and so the banks were staring bankruptcy in the face. In the 2008–2011 period, 318 banks failed in the United States. Bank failures subsequently spread to Europe as well. South Africa's banks, compared to those in America and Europe, are generally well regulated with generally sound balance sheets so the country was spared the worst of the Great Financial Crisis.

The risk of an unexpectedly high level of loan defaults can be especially difficult for banks because a bank's liabilities, namely the deposits of its customers, can be withdrawn quickly, but many of the bank's assets like loans and bonds will only be repaid over years or even decades. This **asset-liability time mismatch**—a bank's liabilities can be withdrawn in the short term while its assets are repaid in the long term—can cause severe liquidity problems for a bank. For example, imagine a bank that has loaned a substantial amount of money at a certain interest rate, but then sees interest rates rise substantially. The bank can find itself in a precarious situation. If it does not raise the interest rate it pays to depositors, then deposits will flow to other institutions that offer the higher interest rates that are now

prevailing. However, if the bank raises the interest rates that it pays to depositors, it may end up in a situation where it is paying a higher interest rate to depositors than it is collecting from those past loans that were made at lower interest rates. Clearly, the bank cannot survive in the long term if it is paying out more in interest to depositors than it is receiving from borrowers.

How can banks protect themselves against an unexpectedly high rate of loan defaults and against the risk of an asset-liability time mismatch? One strategy is for a bank to **diversify** its loans, which means lending to a variety of customers. For example, suppose a bank specialized in lending to a specific market only—say, making a high proportion of its loans to construction companies that build offices in one particular area of a city or town. If that one area suffers an unexpected economic downturn, the bank will suffer large losses. However, if a bank loans both to consumers who are buying homes and cars and also to a wide range of firms in many industries and geographic areas, the bank is less exposed to risk. When a bank diversifies its loans, those categories of borrowers who have an unexpectedly large number of defaults will tend to be balanced out, according to random chance, by other borrowers who have an unexpectedly low number of defaults. Thus, diversification of loans can help banks to keep a positive net worth. However, if a widespread recession occurs that touches many industries and geographic areas, diversification will not help.

Along with diversifying their loans, banks have several other strategies to reduce the risk of an unexpectedly large number of loan defaults. For example, banks can sell some of the loans they make in the secondary loan market, as described earlier, and instead hold a greater share of assets in the form of government bonds or reserves. Nevertheless, in a lengthy recession, most banks will see their net worth decline because a higher share of loans will not be repaid in tough economic times.

Key Concepts and Summary

Banks facilitate the use of money for transactions in the economy because people and firms can use bank accounts when selling or buying goods and services, when paying a worker or being paid, and when saving money or

receiving a loan. In the financial market, banks are financial intermediaries; that is, they operate between savers who supply financial capital and borrowers who demand loans. A balance sheet (sometimes called a T-account) is an accounting tool which lists assets in one column and liabilities in another column. The liabilities of a bank are its deposits. The assets of a bank include its loans, its ownership of bonds, and its reserves (which are not loaned out). The net worth of a bank is calculated by subtracting the bank's liabilities from its assets. Banks run a risk of negative net worth if the value of their assets declines. The value of assets can decline because of an unexpectedly high number of defaults on loans, or if interest rates rise and the bank suffers an asset-liability time mismatch in which the bank is receiving a low rate of interest on its long-term loans but must pay the currently higher market rate of interest to attract depositors. Banks can protect themselves against these risks by choosing to diversify their loans or to hold a greater proportion of their assets in bonds and reserves. If banks hold only a fraction of their deposits as reserves, then the process of banks' lending money, those loans being re-deposited in banks, and the banks making additional loans will create money in the economy.

Self-Check Questions

Exercise:

Problem:

Explain why the money listed under assets on a bank balance sheet may not actually be in the bank?

Solution:

A bank's assets include cash held in their vaults, but assets also include monies that the bank holds at the Reserve Bank (called "reserves"), loans that are made to customers, and bonds.

Review Questions

Exercise:

Problem: Why is a bank called a financial intermediary?

Exercise:

Problem: What does a balance sheet show?

Exercise:

Problem: What are the assets of a bank? What are its liabilities?

Exercise:

Problem: How do you calculate the net worth of a bank?

Exercise:

Problem: How can a bank end up with negative net worth?

Exercise:

Problem: What is the asset-liability time mismatch that all banks face?

Exercise:

Problem: What is the risk if a bank does not diversify its loans?

Critical Thinking Questions

Exercise:

Problem:

Explain the difference between how you would characterize bank deposits and loans as assets and liabilities on your own personal balance sheet and how a bank would characterize deposits and loans as assets and liabilities on its balance sheet.

Problems

Exercise:

Problem:

A bank has deposits of R4000. It holds reserves of R500. It has purchased government bonds worth R700. It has made loans of R5000. Set up a T-account balance sheet for the bank, with assets and liabilities, and calculate the bank's net worth.

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Glossary

asset

item of value owned by a firm or an individual

asset–liability time mismatch

a bank's liabilities can be withdrawn in the short term while its assets are repaid in the long term

balance sheet

an accounting tool that lists assets and liabilities

bank capital

a bank's net worth

depository institution

institution that accepts money deposits and then uses these to make loans

diversify

making loans or investments with a variety of firms, to reduce the risk of being adversely affected by events at one or a few firms

financial intermediary

an institution that operates between a saver with financial assets to invest and an entity who will borrow those assets and pay a rate of return

liability

any amount or debt owed by a firm or an individual

net worth

the excess of the asset value over and above the amount of the liability;
total assets minus total liabilities

payment system

helps an economy exchange goods and services for money or other financial assets

reserves

funds that a bank keeps on hand and that are not loaned out or invested in bonds

T-account

a balance sheet with a two-column format, with the T-shape formed by the vertical line down the middle and the horizontal line under the column headings for “Assets” and “Liabilities”

transaction costs

the costs associated with finding a lender or a borrower for money

How Banks Create Money

By the end of this section, you will be able to:

- Utilize the money multiplier formula to determine how banks create money
- Analyze and create T-account balance sheets
- Evaluate the risks and benefits of money and banks

let's create some money!!



Figure A. Banks don't actually create money this way.

Banks and money are intertwined. It is not just that most money is in the form of bank accounts. The banking system can literally create money through the process of making loans. Let's see how.

Money Creation by a Single Bank

Start with a hypothetical bank called Singleton Bank. The bank has R10 million in deposits. The T-account balance sheet for Singleton Bank, when it holds all of the deposits in its vaults, is shown in Figure 1. At this stage, Singleton Bank is simply storing money for depositors and is using these deposits to make loans. In this example, we ignore interest

rates and interest to avoid messy figures and to keep things simple for the sake of explanation. So Singleton Bank cannot earn any interest income from these loans and cannot pay its depositors an interest rate either (of course this would not be the case in the real world).

Singleton Bank's Balance Sheet: Receives R10 million in Deposits

Assets		Net Worth + Liabilities	
Reserves	R10 million	Deposits	R10 million

Figure 1

We can work out the effect on the total money supply as follows:

Change in total money supply = Change in cash in circulation + Change in demand deposits

Change in total money supply = -R10 million + R10 million = 0. The deposit of cash (most likely by check payment or EFT) into a Singleton Bank account reduced the amount of cash in circulation outside the monetary sector. However, this reduction in the amount of cash available for medium of exchange purposes is exactly offset (balanced) by the creation of a demand deposit of the same value. So, at this stage, there has been no change in the total money supply. Demand deposits created from new cash reserves/deposits do not increase the money supply. Newly created demand deposits that do not increase the money supply are termed **passive** deposits and are the result of **passive** deposit creation (using new cash deposits/new cash reserves to create demand deposits).

Singleton Bank is required by the Reserve Bank to keep R1 million on reserve (we assume for this example that all banks are required to retain 10% of total deposits as required reserves). It will loan out the remaining R9 million. By loaning out the R9 million and charging interest, it will be able to make interest payments to depositors and earn interest income for Singleton Bank (for now, we will keep it simple and not put interest income on the balance sheet). Instead of becoming just a storage place for deposits, Singleton Bank can become a financial intermediary between savers and borrowers.

This change in business plan alters Singleton Bank's balance sheet, as shown in Figure 2. Singleton's assets have changed; it now has R1 million in reserves and a loan to Sipho's Auto Supply of R9 million. The bank still has R10 million in deposits.

Singleton Bank's Balance Sheet: 10% Reserves, Round One of Loan Creation

Assets		Net Worth + Liabilities	
Reserves	R1 million	Deposits	R10 million
Loan to Sipho Auto Supply	R9 million		

Figure 2

Singleton Bank lends R9 million to Sipho's Auto Supply whose main business check account is at Great National Bank. Singleton Bank records this loan to its new client by making an entry on its balance sheet to indicate that a loan has been made. This loan is an asset, because it will generate interest income for the bank. Of course, the loan officer is not going to let Sipho walk out of the bank with R9 million in cash. The bank issues Sipho's Auto Supply a cashier's check for the R9 million. Sipho deposits the loan in his regular checking account with Great National Bank. The deposits at Great National Bank rise by R9 million and its reserves also rise by R9 million, as Figure 3 shows. Great National Bank must hold 10% of additional deposits as required reserves but is free to loan out the rest

Great National Bank's Balance Sheet: Receives R9 million in Deposits

Assets		Net Worth + Liabilities	
Reserves	R9 million	Deposits	R9 million

Figure 3

Making loans that are deposited into a demand deposit account increases the M1 money supply. Demand deposits that are created from loans are termed **active** deposits since they increase the money supply, unlike passive deposits (which are created from deposits of cash by the banks' clients). Remember the definition of M1 includes checkable (demand) deposits, which can be easily used as a medium of exchange to buy goods and services. Notice that the money supply is now R19 million: R10 million in **passive** deposits in Singleton bank and R9 million in **active** deposits at Great National Bank. Obviously these deposits will be drawn down as Sipho's Auto Supply writes checks to pay its bills. But the bigger picture is that a bank must hold enough money in reserves to meet its liabilities; the rest the bank loans out. In this example so far, bank lending has expanded the money supply by R9 million. This is "new money", as it were, new spending power created from a deposit of funds at Singleton Bank. We can follow this money creation process as follows:

Change in total money supply = Change in cash in circulation + Change in demand deposits

Change in total money supply = -R10 million + R10 million (passive deposit) + R9 million (active deposit) = R9 million

Now, Great National Bank must hold only 10% as required reserves (R900,000) but can lend out the other 90% (R8.1 million) in a loan to Ravi's Mahindra Dealership as shown in Figure 4. Ravi, in securing a loan from Great National Bank becomes one of its clients. However, Ravi's main business check account is at Dodgy Bank.

Great National Bank's Balance Sheet: 10% Reserves, Round Two of Loan Creation

Assets		Net Worth + Liabilities	
Reserves	R900 000	Deposits	R9 million
Loan to Ravi's Mahindra dealership	R8.1 million		

Figure 4

If Ravi deposits the loan in his checking account at Dodgy Bank, the money supply just increased by an additional R8.1 million, as Figure 5 shows.

Dodgy Bank's Balance Sheet: Receives R8.1 million in Deposits

Assets		Net Worth + Liabilities	
Reserves	R8.1 million	Deposits	R8.1 million

Figure 5

Again, we can follow this money creation process after just two rounds of loan creation as follows:

Change in total money supply = Change in cash in circulation + Change in demand deposits

Change in total money supply = -R10 million + R10 million (Singleton Bank passive deposit) + R9 million (Singleton Bank active deposit) + R8.1 million (Great National Bank active deposit) = R17.1 million.

So after just two rounds of loan creation/active deposit creation, the money supply has increased by R17.1 million. We cannot include the original passive deposit of R10 million as constituting an increase in the money supply because this was effectively created from a 100% cash deposit at Singleton Bank. This amounts to a fall in cash reserves in circulation

outside the monetary system (banks). So now the cash that was previously in circulation outside the banks is held by Singleton bank as part of its cash reserves. It is no longer available to be spent "out there". Instead Singleton Bank created a demand deposit account against which drawings can be made to the exact value of the cash deposit. So the first deposit, being a passive deposit (swapped for cash), does not increase the money supply.

The money "creation" process can carry on for as long as banks have excess cash reserves (more than the minimum required reserves). Dodgy Bank, for example, would look to increase the number and amount of loans it can grant given that its cash reserves increased by R8.1 million and so forth.

It now becomes clearer that money "creation" results from granting loans (active deposits) that are "backed" by cash reserves held by the bank that granted the loan. The cash reserves supporting these active deposits/loans are a fraction of the value of the loans granted, in this case 10%. The purpose of the cash reserve requirement is to guarantee the liquidity of the banking/payments system. So if a bank's clients require their funds from the bank then the cash reserve requirement ensures that banks will always have at least some funds on hand to service their liabilities to customers. Banks cannot risk loaning out 100% of their reserves for this reason.

How is money creation by financial institutions such as banks possible? It is possible because there are multiple banks in the financial system, they are required to hold only a fraction of their deposits, and loans end up deposited in other banks, which increases deposits and, in essence, the money supply.

Note:

Watch this [video](#) to learn more about how banks create money.



The Money Multiplier and a Multi-Bank System

In a system with multiple banks, the initial excess reserve amount that Singleton Bank decided to lend to Sipho's Auto Supply was deposited into Great National Bank, which is free to loan out R8.1 million. If all banks loan out their excess reserves, the money supply will expand. In a multi-bank system, the amount of money that the system can create is

found by using the money multiplier. The money multiplier tells us by how many times a loan will be “multiplied” as it is spent in the economy and then re-deposited in other banks.

Fortunately, a formula exists for calculating the total of these many rounds of lending in a banking system. The **money multiplier formula** is:

Equation:

$$\frac{1}{\text{Reserve Requirement}}$$

The money multiplier is then multiplied by the change in the first bank's (Singleton Bank in this case) **excess** reserves to determine the total amount of M1 money supply created in the banking system. See the Work it Out feature to walk through the multiplier calculation.

Note:

Using the Money Multiplier Formula

Using the money multiplier for the example in this text:

Step 1. In the case of Singleton Bank, for whom the reserve requirement is 10% (or 0.10), the money multiplier is 1 divided by .10, which is equal to 10.

Step 2. We have identified that the excess reserves are R9 million, so, using the formula we can determine the total change in the M1 money supply:

Equation:

$$\begin{aligned}\text{Total Change in the M1 Money Supply} &= \frac{1}{\text{Reserve Requirement}} \times \text{Excess Requirement} \\ &= \frac{1}{0.10} \times \text{R9 million} \\ &= 10 \times \text{R9 million} \\ &= \text{R90 million}\end{aligned}$$

Step 3. Thus, we can say that, in this example, the total quantity of money generated in this economy after all rounds of lending are completed will be R90 million.

Cautions about the Money Multiplier

The money multiplier will depend on the proportion of reserves that banks are required to hold by the Reserve Bank. Additionally, a bank can also choose to hold extra reserves.

Banks may decide to vary how much they hold in reserves for two reasons:

macroeconomic conditions and government rules. When an economy is in recession, banks are likely to hold a higher proportion of reserves because they fear that loans are less likely to be repaid when the economy is slow. The Reserve Bank may also raise or lower the

required reserves held by banks as a policy move to affect the quantity of money in an economy, as the chapter on Monetary Policy and Bank Regulation will discuss.

The process of how banks create money shows how the quantity of money in an economy is closely linked to the quantity of lending or credit in the economy. Indeed, all of the money in the economy, except for the original reserves, is a result of bank loans that are re-deposited and loaned out, again, and again.

Finally, the money multiplier depends on people re-depositing the money that they receive in the banking system. If people instead store their cash in safe-deposit boxes or under their mattresses, then banks cannot recirculate the money in the form of loans. Indeed, central banks have an incentive to assure that bank deposits are safe because if people worry that they may lose their bank deposits, they may start holding more money in cash, instead of depositing it in banks, and the quantity of loans in an economy will decline. Low-income countries have what economists sometimes refer to as “mattress savings,” or money that people are hiding in their homes because they do not trust banks. When mattress savings in an economy are substantial, banks cannot lend out those funds and the money multiplier cannot operate as effectively. The overall quantity of money and loans in such an economy will decline and this is likely to affect economic activity (that is, spending, production and earning income as per the circular flow model).

Note:

Watch a [video](#) of Jem Bendell discussing “The Money Myth.”



Money and Banks—Benefits and Dangers

Money and banks are marvelous social inventions that help a modern economy to function. Compared with the alternative of barter, money makes market exchanges much easier in goods, labor, and financial markets. Banking makes money still more effective in facilitating exchanges in goods and labor markets. Moreover, the process of banks making loans in financial capital markets is intimately tied to the creation of money.

But the extraordinary economic gains that are possible through money and banking also suggest some possible corresponding dangers. If banks are not working well, it sets off a

decline in convenience and safety of transactions throughout the economy. If the banks are under financial stress, because of a widespread decline in the value of their assets, loans may become far less available, which can deal a crushing blow to sectors of the economy that depend on borrowed money like business investment, home construction, and car manufacturing. The Great Recession of 2008–2009 illustrated this pattern.

Note:

The Many Disguises of Money: From Cowries to Bit Coins

The global economy has come a long way since it started using cowrie shells as currency. We have moved away from commodity and commodity-backed paper money to fiat currency. As technology and global integration increases, the need for paper currency is diminishing, too. Every day, we witness the increased use of debit and credit cards. The latest creation and perhaps one of the purest forms of fiat money is the Bitcoin. (Bitcoin: 2016) Bitcoins are a digital currency that allows users to buy goods and services online. Products and services such as videos and books may be purchased using Bitcoins. It is not backed by any commodity nor has it been decreed by any government as legal tender, yet it is used as a medium of exchange and its value (online at least) can be stored. It is also unregulated by any central bank, but is created online through people solving very complicated mathematics problems and getting paid afterward. Bitcoins are a relatively new type of money. At present, because it is not sanctioned as a legal currency by any country nor regulated by any central bank, it lends itself for use in illegal trading activities as well as legal ones. As technology increases and the need to reduce transaction costs associated with using traditional forms of money increases, Bitcoins or some sort of digital currency may replace our current Rands and cents, just as the cowrie shell was replaced.

Key Concepts and Summary

The money multiplier is defined as the quantity of money that the banking system can generate from each R1 of bank reserves. The formula for calculating the multiplier is $1/\text{reserve ratio}$, where the reserve ratio is the fraction (percent) of deposits that the bank wishes to hold as reserves. The quantity of money in an economy and the quantity of credit for loans are inextricably intertwined. Much of the money in an economy is created by the network of banks making loans, people making deposits, and banks making more loans.

Given the macroeconomic dangers of a malfunctioning banking system, the chapter on Monetary Policy and Bank Regulation will discuss policies for controlling the money supply and for keeping the banking system safe.

Self-Check Questions

Exercise:**Problem:**

Imagine that you are in the position of buying loans in the secondary market (that is, buying the right to collect the payments on loans made by banks) for a bank or other financial services company. Explain why you would be willing to pay more or less for a given loan if:

- a. The borrower has been late on a number of loan payments
- b. Interest rates in the economy as a whole have risen since the loan was made
- c. The borrower is a firm that has just declared a high level of profits
- d. Interest rates in the economy as a whole have fallen since the loan was made

Solution:

- a. A borrower who has been late on a number of loan payments looks perhaps less likely to repay the loan, or to repay it on time, and so you would want to pay less for that loan.
- b. If interest rates generally have risen, then this loan made at a time of relatively lower interest rates looks less attractive, and you would pay less for it.
- c. If the borrower is a firm with a record of high profits, then it is likely to be able to repay the loan, and you would be willing to pay more for the loan.
- d. If interest rates in the economy have fallen, then the loan is worth more.

Review Questions**Exercise:**

Problem: How do banks create money?

Exercise:

Problem: What is the formula for the money multiplier?

Critical Thinking Questions**Exercise:**

Problem: Should banks have to hold 100% of their deposits? Why or why not?

Exercise:

Problem:

Explain what will happen to the money multiplier process if there is an increase in the reserve requirement?

Exercise:**Problem:**

Refer to Dodgy Bank's balance sheet in Figure 5. What value of loans could it create if the reserve requirement was reduced to 5% from 10%? Calculate the change in total money supply that was kicked off by the initial deposit of R10 million in Singleton Bank (use the 5% reserve requirement).

Problems**Exercise:****Problem:**

Humongous Bank is the only bank in the economy. The people in this economy have R20 million in money (cash), and they deposit all their money in Humongous Bank.

- a. Humongous Bank decides on a policy of holding 100% reserves. Draw a T-account for the bank.
- b. Humongous Bank is required to hold 5% of its existing R20 million as reserves, and to loan out the rest. Draw a T-account for the bank after this first round of loans has been made.
- c. Assume that Humongous bank is part of a multibank system. How much will money supply increase with that original loan of R19 million?

References

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Glossary

money multiplier formula

total money in the economy divided by the original quantity of money, or change in the total money in the economy divided by a change in the original quantity of money

Introduction to Monetary Policy and Bank Regulation

class="introduction"



Figure 1 The South African Reserve Bank Building, Pretoria (Credit: REUTERS: 2016)

Note:

Most economists believe that monetary policy (the manipulation of interest rates and credit conditions by a nation's central bank) has a powerful influence on a nation's economy. Monetary policy works when the central bank reduces interest rates and makes credit more available. As a result, business investment and other types of spending increase, causing GDP and employment to grow.

Note:

Introduction to Monetary Policy and Bank Regulation

In this chapter, you will learn about:

- The Central Banking System generally and the South African Reserve Bank in particular
- Bank Regulation as well as some of the Reserve Bank's other functions
- How a Central Bank Executes Monetary Policy
- Monetary Policy and Economic Outcomes
- Pitfalls for Monetary Policy

Money, loans, and banks are all tied together. Money is deposited in bank accounts, which is then loaned to businesses, individuals, and other banks. When the interlocking system of money, loans, and banks works well, economic transactions are made smoothly in goods and labor markets and savers are connected with borrowers. If the money and banking system does not operate smoothly, the economy can either fall into recession or suffer prolonged inflation.

The government of every country has public policies that support the system of money, loans, and banking. But these policies do not always work perfectly. This chapter discusses how monetary policy works and what may prevent it from working perfectly.

The South African Reserve Bank and domestic monetary policy

By the end of this section, you will be able to:

- Explain the structure and organization of the U.S. Federal Reserve
- Discuss how central banks impact monetary policy, promote financial stability, and provide banking services

In making decisions about the money supply, a central bank decides whether to raise or lower interest rates and, in this way, to influence macroeconomic policy, whose goal is low unemployment and low inflation. The central bank is also responsible for regulating all or part of the nation's banking system to protect bank depositors and insure the health of the bank's balance sheet.

The organization responsible for conducting monetary policy and ensuring that a nation's financial system operates smoothly is called the **central bank**. Most nations have central banks or currency boards. Some prominent central banks around the world include the European Central Bank, the Bank of Japan, and the Bank of England. In the United States, the central bank is called the Federal Reserve—often abbreviated as just “the Fed.” This section briefly explains the organization of South Africa's central bank (the **South African Reserve Bank**) and identifies the major responsibilities of a central bank.

Structure/Organization of the South African Reserve Bank

Unlike most central banks, the Reserve Bank has always been privately owned between more than 600 shareholders. Even so, it is an organization that has come into being through statute (law). The Reserve Bank cannot amend or change its founding structure since this can be effected only by Parliament. Following payment of the Bank's operating costs, tax on profits and transfers to reserves and dividend payments, the surplus of its earnings are paid to the Government. The Reserve Bank's operations are therefore not driven by a profit motive. On the contrary, the intention is that it should serve the best interests of all South Africa's people (South African Reserve Bank: 2016).

The South African Reserve Bank Act (1989) makes provision for a board of 15 directors. Included in the board are the Governor and three Deputy Governors, who are appointed by the President of the Republic of South Africa, after consultation with the Minister of Finance and the Board, initially for five-year terms. Besides the governors, four other directors are appointed by the President, after consultation with the Minister, for three-year terms. The balance of seven directors are elected by shareholders at an ordinary general meeting (OGM) of shareholders. At least one of these directors is required to have knowledge and skill in the field of agriculture, another in the field of labor, one in the field of mining, two in the field of industry and two in the field of commerce or finance (South African Reserve Bank: 2016).

Meet the governor of the South African Reserve Bank



Figure 1 Reserve Bank Governor, Lesetja Kganyago (Credit: Lesetja Kganyago: 2016)

Note:

Visit this [website](#) to see who the current Board of Directors of the South African Reserve Bank are.



What Does a Central Bank Do?

The Reserve Bank's main objective is to achieve and maintain price stability in order to accommodate balanced and sustainable economic growth in South Africa. Along with other financial institutions, it also plays a central role in ensuring financial stability. The South African Reserve Bank (SARB), like most central banks, is designed to perform several important functions. These include:

- Supervising the commercial banking sector
- Ensuring the efficient operation of the national payment system
- Performing lender of the last resort duties in exceptional circumstances
- Issuing banknotes and coin
- Devising and implementing monetary policy
- Managing the country's official gold and foreign-exchange reserves
- Policing the country's remaining exchange controls
- Offering banking services to the government

Bank Supervision

Although loaning of money is not formally restricted, only registered banks may accept deposits from the general public. Should a bank experience financial difficulties and be unable to repay its depositors, people risk losing their money. Consequently, in order to ensure that the deposits taken from the public are used responsibly and to protect the public at large, banks have

to be supervised and regulated. The Reserve Bank's Bank Supervision Department (BSD) plays an important role in this regard (South African Reserve Bank: 2016).

The Reserve Bank acts as custodian of the cash reserves that banks are legally required to hold as well as those they prefer to hold voluntarily with the Bank. The Bank has the authority to change the minimum cash reserves that banks are required to hold and can use such adjustments to influence bank liquidity and the amount of money in circulation (South African Reserve Bank: 2016).

Managing the National Payments System

The National Payments System is a keystone that holds in place the financial stability of the economic system. The Reserve Bank manages the safety and soundness of the national payment system and puts in place risk-reduction measures in the payment system to reduce systemic risk. The Reserve Bank also provides an inter-bank settlement service via the real-time electronic settlement system, the South African Multiple Option Settlement (SAMOS) system. In addition to single settlements between banks, SAMOS is also used for the settlement of payments resulting from retail payment clearing and the Equity and Bond markets. In exceptional circumstances the SARB may act as "**lender of last resort**" when banks experience liquidity problems and are unable to borrow funds from each other. The way in which the SARB accommodates or finances the commercial banking sector when it is short of liquidity is termed the **refinancing system** and is an important component of its **monetary policy** (Mohr: 2015).

Issuing Banknotes and Coins

The South African Mint Company (which is owned by the South African Reserve Bank) mints, by law, all of the country's coins. The South African Bank Note Company, also owned by the South African Reserve Bank and also by government fiat, produces all of the nation's banknotes (Mohr: 2015). The SARB is guided by the public's cash requirements in deciding on the quantity of cash (notes and coins) to be issued. Cash issued by the Reserve Bank is injected into the financial system through its purchase of financial assets from commercial banks and other financial institutions.

Remember that coins and banknotes become "money" (part of the M1 money supply) only when they begin to circulate outside the banking sector.

Devising and Implementing Monetary Policy

The South African Reserve Bank is responsible for devising and implementing the country's monetary policy. Monetary policy refers to the measures taken by monetary authorities to influence the quantity of money and the rate of interest (the cost of credit) in a country, with a view to achieving stable prices and facilitating full employment and sustainable economic growth. South Africa's monetary policy is conducted within an inflation targeting framework (South African Reserve Bank: 2016).

The main tool that the South African Reserve Bank uses to conduct monetary policy is its **refinancing system** or, alternatively termed, the **repo rate** tender system (Mohr: 2015). The Bank uses the refinancing system to meet the daily cash requirements of the commercial banks (private banks). Its refinancing system (or the terms on which it **accommodates** requests for loans from commercial banks) is the main instrument by which it regulates the quantity of money through variations in the cost of credit/interest rate (Mohr: 2015). We will revisit monetary policy in more detail later on.

Management of Gold and Foreign Reserves

The South African Reserve Bank has managed and held gold reserves since 1925 and purchases nearly all the local gold production. Since 1997, South African gold producers can elect to sell all of their output themselves to approved buyers. This arrangement significantly reduced the Bank's transactions in the gold market. However, it continues to monitor the gold market closely since its opinion in respect of the gold market is still required and valued (South African Reserve Bank: 2016). Thus, with the exception of required balances held by commercial banks and the Treasury, the SARB holds all the country's gold as well as foreign reserves. The level of South Africa's gold and foreign reserves is an important indicator of the health of the domestic economy and the prospects for economic growth (Mohr: 2015).

The Money Market

It seems strange to consider money as a commodity that can be bought and sold in a market much like any other goods. After all, we use money to buy and sell goods and services. And we use money to buy and sell...well, money! Monetary policy is largely conducted via the market for money. We cannot talk about markets without talking about demand and supply. In this section we examine the demand for, and supply of, money. Following this, we consider monetary policy in more detail.

The demand for money

In macroeconomic theory, **liquidity preference** refers to the demand for money or liquidity. The concept was first developed by John Maynard Keynes in his book, *The general theory of employment, interest and money* (1936) to explain determination of the interest rate by the supply and demand for money (Liquidity preference: 2016).

According to Keynes, demand for liquidity (money) is determined by three motives:

- the **transactions** motive: people prefer to have liquidity to assure basic transactions, for their income is not constantly available. The amount of liquidity demanded is determined by the level of income: the higher the income, the more money demanded for carrying out increased spending. The transactions demand for money is also referred to as the demand for **active balances, L1**.
- the **precautionary** motive: people prefer to have liquidity in the case of social unexpected problems that need unusual costs. The amount of money demanded for this purpose increases as income increases. The precautionary demand for money, like the transactions demand for money, is also referred to as a demand for **active balances, L1**.
- The **speculative** motive: people retain liquidity to speculate that bond prices will fall. When the interest rate decreases people demand more money to hold until the interest rate increases, which would drive down the price of an existing bond to keep its yield in line with the interest rate. Thus, the lower the interest rate, the more money demanded (and vice versa). The speculative demand for money is alternatively known as the demand for **passive balances, L2**.

The total demand for money (L) is the sum of active (L_1) and passive balances (L_2) and therefore depends on both the level of income (Y) and the interest rate (i). We understand the "interest rate" to be the price of borrowed money (loanable funds). In our analysis we take the "interest rate" to refer to the general interest rate level in the economy. In fact there are many different interest rates in the economy (depending on the different financial products). However, all the interest rates move in the same direction whether up or down. So our interest rate in this discussion simply reflects all interest rates just to make our analysis simpler. We can represent the total demand for money (liquidity, L) as follows:

Deriving the total demand for liquidity (money)

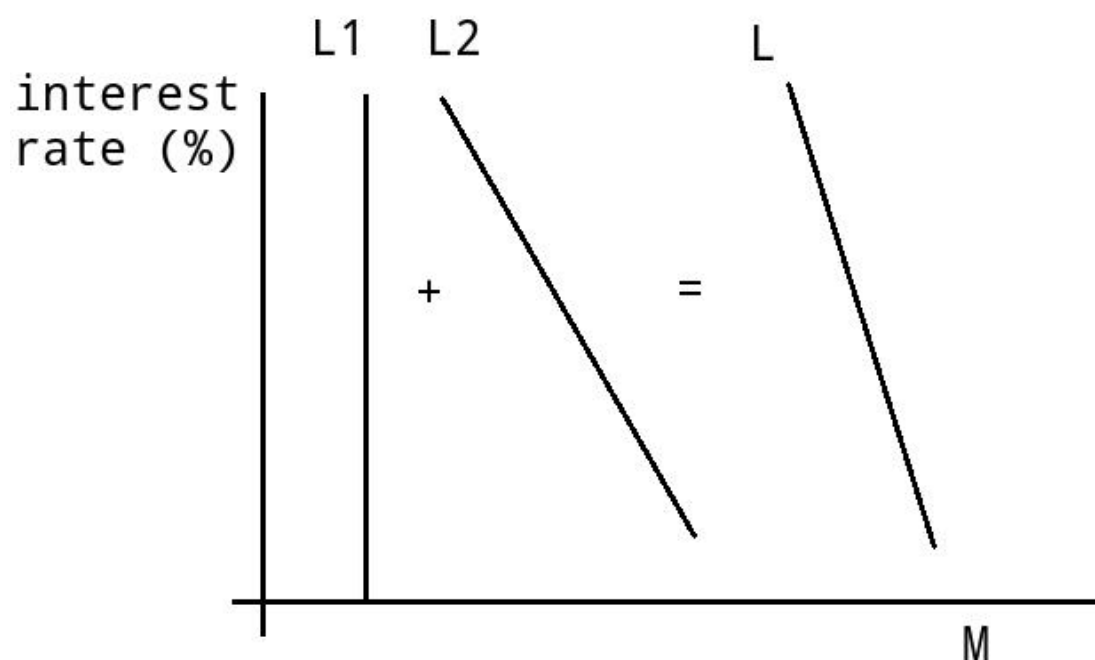


Figure 2. The total demand for money (L) is the sum of the transactions/precautionary demand for money (L_1 , active balances) and asset/speculative demand for money (L_2 , passive balances).

Note that, even though the demand for passive balances is not sensitive to the interest rate, the **overall (total)** demand for money/liquidity, L , is. This has a very important implication for monetary policy. The fact that the total demand for money depends on the rate of interest suggests that interest rates can be an important tool for managing the demand for money. We will get back to this later.

The supply of money

In our analysis we assume that the money stock in the country is controlled by the South African Reserve Bank (which is a reasonable assumption) and that the amount of money it puts into circulation in the economy does not depend on the rate of interest. This would make for a perfectly inelastic (vertical supply curve of money, as shown by the $M2$ or $M1$ supply "curves") as shown in Figure 3. From this money market diagram, we see that the interest rate (price of money) is determined by the demand for, and supply (even though it is shown here as a stock) of money.

Money market equilibrium

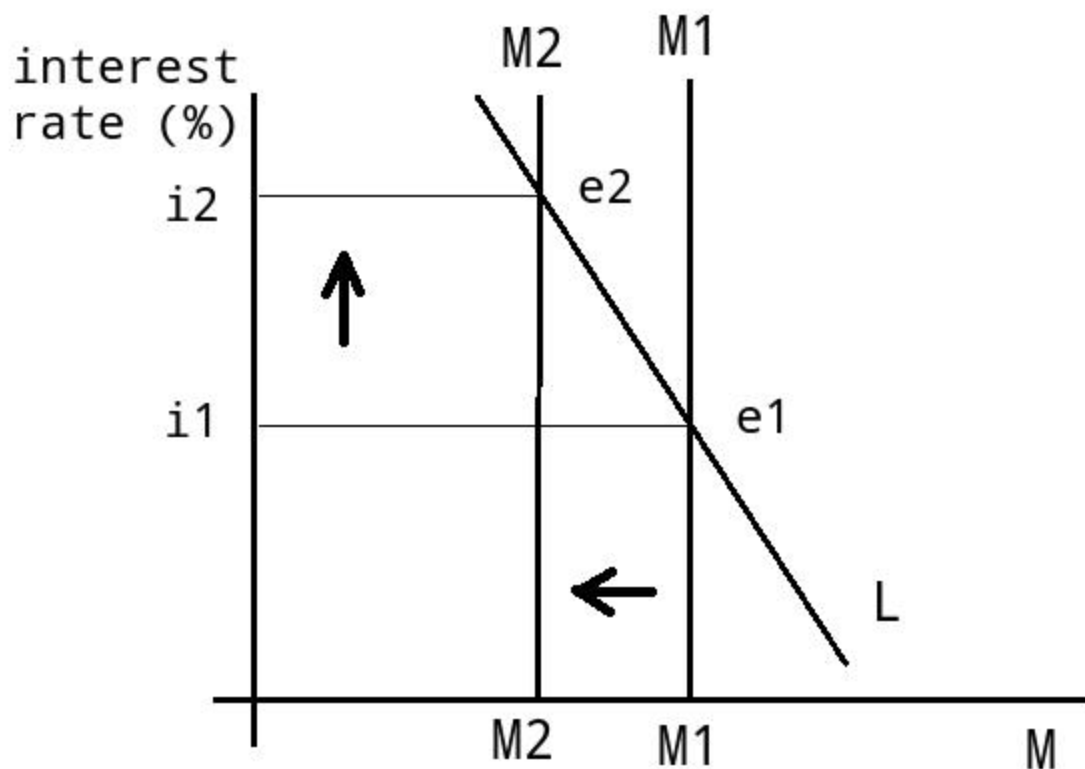


Figure 3. Money market equilibrium.

Figure 3 suggests that the monetary authorities can influence the rate of interest by either increasing or decreasing the stock of money. So, for example, if the South African Reserve Bank wanted to increase interest rates in the economy from i_1 to i_2 , it would need to somehow decrease the money stock from M_1 to M_2 . Alternatively, if it wanted to lower interest rates then it would need to increase the money stock from M_2 to M_1 . In this view it is assumed that the money supply is controlled by the Reserve Bank and that its supply does not depend on the rate of interest (hence the vertical money supply). So the money supply is **exogenously** determined (that is, outside of the money market, by the SARB).

However, the view that interest rates are determined by the demand for, and supply of money, is quite theoretical. In practice, there is no independent supply of money curve. Rather, the stock of money is determined by the interaction of the demand for money and the interest rate (Mohr: 2015) with

interest rates being controlled by the Reserve Bank. In this view, the quantity of money that finds its way into the economy depends on the demand for money and the interest rate (cost of credit). So in fact the money stock is demand-determined or **endogenously** determined (that is, within the money market, according to money demand and the cost of credit).

Whichever view is used to explain monetary policy, it comes down to the same thing in the end. Central banks regulate money creation by influencing the demand for credit/loans via the prices of these borrowed funds: interest rates. So Figure 4 illustrates that the quantity of money is determined by the interaction of the interest rate and the demand for money. At interest rate i_1 the quantity demanded of money will be M_1 . If the South African Reserve Bank increases interest rates to i_2 , then - ceteris paribus (all things being equal) - the quantity demanded of money will fall to M_2 . Total market demand for liquidity (money)

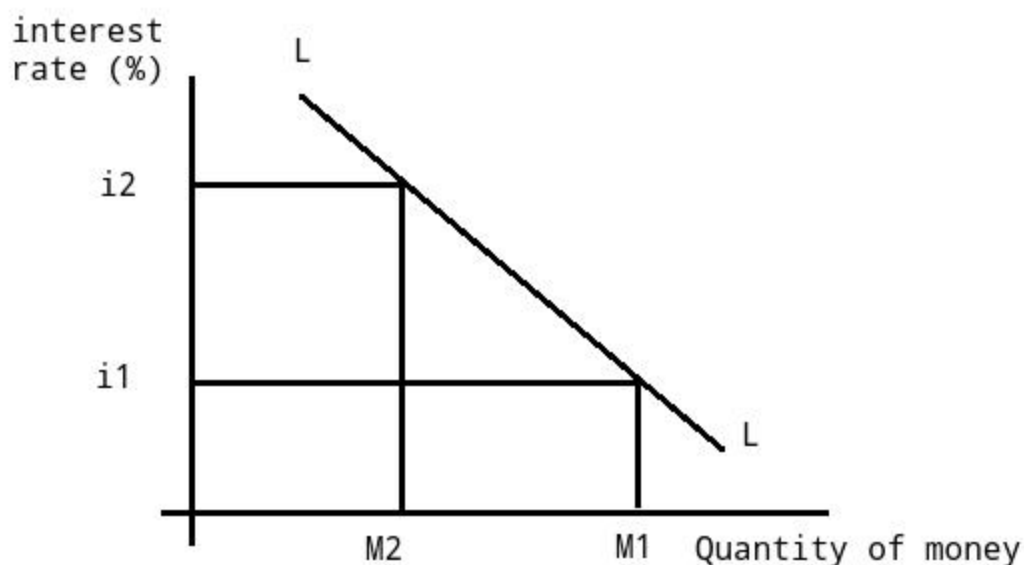


Figure 4. The total/overall demand for money is sensitive to the rate of interest.

A modern market economy requires its money stock to match its level of economic activity. Too little money to service transactions may stifle or otherwise hold back spending, production and income earning activities. Too much money in circulation may cause overheating, that is, too much spending and hence inflation and the other economic problems that go with that. Monetary policy is about managing the amount of money to suit the country's required level of economic activity.



Figure 5. Monetary policy essentially means

matching the amount of money released into the economy with the amount of economic activity.

The Low Down on Monetary Policy in South Africa

Monetary policy refers to the measures taken by the monetary authorities to influence the quantity of money or the rate of interest with the aim of achieving stable prices, full employment and sustainable economic growth (Mohr: 2015). We have seen that the preferred monetary policy tool is in fact the **interest rate** as opposed to the quantity of money. So the expectation is that the quantity of money will respond to interest rate control and not vice versa.

Monetary policy in South Africa is set by the Reserve Bank's Monetary Policy Committee (MPC). The MPC comprises eight members of the Bank: the Governor, three deputy governors and four senior officials of the Bank. Its monthly meetings are chaired by the Governor of the Bank (South African Reserve Bank: 2016).

South Africa introduced the policy of **inflation targeting** in February 2000. Prior to this the Reserve Bank had adopted a number of frameworks including exchange-rate targeting, discretionary monetary policy, monetary-aggregate targeting as well as some combination of these various approaches (South African Reserve Bank: 2016). Inflation targeting is a monetary policy system in which the central bank announces an explicit inflation-targeting framework. The advantage of this is the greater degree of transparency it brings to monetary policy. The inflation target remains between 3% - 6% per year as measured by the annual percent increase in the Consumer Price Index.

Aspects of South African Monetary Policy

South Africa's monetary policy is geared to promote balanced and sustainable economic growth (Mohr: 2015). In order to achieve this it strives to create and sustain a stable financial environment (price stability) and it is guided by the formal inflation target in pursuing this objective. The South African Reserve Bank's primary tool of monetary control is the general level of interest rates which, in turn are governed by changes in the

repo rate (which is under the direct control of the SARB). Additional monetary control is exercised by the SARB through the classical cash reserve system.

The Repo Rate

Repo rate refers to "repossession". So the repo rate is the rate at which a central bank repurchases (repossesses) government securities from the commercial banks, depending on the level of money supply it decides to maintain in the country's monetary system. If the central bank wants to expand the money supply, it will decrease the repo rate (so that banks can swap their holdings of government securities for cash). To reduce the money supply it will increase the repo rate (Repo rate: 2016). Alternatively, one can simply think of the repo rate as the rate of interest that the central bank charges the commercial banks for short term loans. Of course changes in the repo rate will have a knock-on effect for all other interest rates in the economy. Thus an increase in the repo rate will feed through into an increase in all other interest rates. In the same way a decrease in the repo rate will result in a lowering of all other interest rates.

Elements of South Africa's cash reserve system

In compliance with South Africa's banking legislation commercial banks are required to hold a minimum **cash reserve** requirement of 2.5% of their total liabilities with the South African Reserve Bank (Reserve ratios: 2016). In addition to this aspect of monetary control various measures, including **open market policy**, are employed to maintain a persistent shortage of liquidity (cash) in the money market so as to render commercial banks dependent on the Reserve Bank for short term loans. This places the SARB in a strong position to influence the cost of credit when it accommodates **(accommodation policy)** commercial banks' requests for loans via the repo rate it charges for any loans. As we discussed earlier, the repo rate directly influences all other short-term interest rates which, in turn, will have an impact on credit creation and the stock of money and hence on spending and production and income.

The Main Instruments of South African Monetary Policy

The two primary tools of monetary policy in South Africa are **accommodation policy** and **open market policy**. The two policies are not independent and in fact complement each other.

Accommodation (refinancing) policy

"Accommodation" in the context of monetary policy refers to the Reserve Bank's willingness to accommodate (or agree to) the requests of commercial banks for short term loans. Since the monetary authorities take measures to maintain a constant shortage of liquidity (cash) in the money market, commercial banks often need to make up any shortage of funds by selling their financial assets (bonds etc.) or by borrowing money from each other at the interbank overnight rate (Mohr: 2015). Should they fail to raise the needed cash by borrowing in the interbank market, the SARB as **lender of last resort** can advance short term loans to commercial banks.

The repurchase (repo) tender system is used to conduct accommodation policy. A "repo" refers to the sale of a financial security (such as government bonds, Treasury Bills, Land Bank Bills and SARB debentures). An agreement by the seller to buy back (repurchase) the same security on a specified future date (normally not more than a week later) forms part of the sale agreement. Included in the repurchase price of the security is an amount of interest which represents the cost of having the funds for a week (Mohr: 2015). Commercial banks apply for accommodation or **refinancing** by tendering for SARB funds at the weekly auctions of repos that have short term maturities of no longer than seven days.

The South African Reserve Bank's accommodation/refinancing policy thus consists of changes in the repo rate as well as changes in other conditions on which funds are made available to the commercial banking sector (Mohr: 2015). So the repo rate is an important tool that the Reserve Bank employs to vary the cost of credit and so regulate the quantity of money inserted into the economy. Money market interest rate changes follow repo rate changes announced by the SARB. The cost of credit is thus directly influenced by the repo rate.

Open Market Policy

Open market policy in the context of monetary policy refers to the sale or purchase by the central bank of domestic financial assets such as

government bonds and Treasury bills with the objective of influencing interest rates and the quantity of money. The effectiveness of open market policy depends on the minimum cash reserve requirement that all commercial banks in South Africa are subject to.

Open market sales of financial assets/securities to commercial banks will reduce their reserves of cash and also the amount of credit they can grant in line with the minimum cash reserve requirement. In addition they may be forced to borrow funds from the SARB at the repo rate to comply with the existing minimum cash reserve requirement if they are short of cash due to their purchases of financial assets/securities on the open market. In practice open market sales of financial assets/securities are used to support a required increase in the repo rate. In this way open market policy is used to support or reinforce accommodation/refinancing policy. Tighter monetary policy is aimed at cooling down aggregate expenditure by raising the cost of credit (borrowing). Open market sales of securities will force a cash shortage and so force banks to borrow at the higher repo rate intended by the SARB.

Let's see how open market operations can reduce the quantity of money and loans in an economy. Figure 6 (a) shows the balance sheet of Happy Bank before the Reserve Bank sells bonds in the open market. When Happy Bank purchases R30 million in bonds, Happy Bank sends R30 million of its reserves to the SARB, but now holds an additional R30 million in bonds, as shown in Figure 6 (b). However, Happy Bank wants to hold R40 million in reserves, as in Figure 6 (a), so it will adjust down the quantity of its loans by R30 million, to bring its reserves back to the desired level, as shown in Figure 6 (c). In practical terms, a bank can easily reduce its quantity of loans. At any given time, a bank is receiving payments on loans that it made previously and also making new loans. If the bank just slows down or briefly halts making new loans, and instead adds those funds to its reserves, then its overall quantity of loans will decrease. A decrease in the quantity of loans also means fewer deposits in other banks, and other banks reducing their lending as well, as the money multiplier (discussed in the Money and Banking section of this online textbook) takes effect.

Open market sales of government securities: an example

Assets		Liabilities + Net Worth	
Reserves	40	Deposits	400
Bonds	120		
Loans	300	Net Worth	60

(a) The original balance sheet

Assets		Liabilities + Net Worth	
Reserves	$40 - 30 = 10$	Deposits	400
Bonds	$120 + 30 = 150$		
Loans	300	Net Worth	60

(b) The central bank sells bonds to the bank

Assets		Liabilities + Net Worth	
Reserves	$10 + 30 = 40$	Deposits	400
Bonds	150		
Loans	$300 - 30 = 270$	Net Worth	60

(c) The bank makes fewer loans

Figure 6. The paper trail following open market sales of securities by the Reserve Bank.

Open market purchases of financial securities (sometimes referred to as **quantitative easing**) by the South African Reserve Bank indicate loosening monetary policy or easier credit in order to boost aggregate expenditure. These transactions increase the cash reserves of commercial banks which enables them increase their credit granting business and the size of their loan books. Open market purchases of securities normally accompany a policy decision by the SARB to reduce the repo rate.

To see how open market purchases of securities will increase the money supply, consider the balance sheet of Happy Bank, displayed in Figure 7. Figure 7 (a) shows that Happy Bank starts with R460 million in assets, divided among reserves, bonds and loans, and R400 million in liabilities in the form of deposits, with a net worth of R60 million. When the Reserve Bank purchases R20 million in bonds from Happy Bank, the bond holdings of Happy Bank fall by R20 million and the bank's reserves rise by R20 million, as shown in Figure 7 (b). However, Happy Bank only wants to hold R40 million in reserves (the quantity of reserves that it started with in

Figure 7 (a), so the bank decides to loan out the extra R20 million in reserves and its loans rise by R20 million, as shown in Figure 7 (c). The open market operation by the SARB causes Happy Bank to make loans instead of holding its assets in the form of government bonds, which expands the money supply. As the new loans are deposited in banks throughout the economy, these banks will, in turn, loan out some of the deposits they receive, triggering the money multiplier (discussed in the Money and Banking section of this online textbook).

Open market purchases of government securities: an example

Assets		Liabilities + Net Worth	
Reserves	40	Deposits	400
Bonds	120		
Loans	300	Net Worth	60

(a) The original balance sheet

Assets		Liabilities + Net Worth	
Reserves	$40 + 20 = 60$	Deposits	400
Bonds	$120 - 20 = 100$		
Loans	300	Net Worth	60

(b) The central bank buys bonds

Assets		Liabilities + Net Worth	
Reserves	$60 - 20 = 40$	Deposits	400
Bonds	100		
Loans	$300 + 20 = 320$	Net Worth	60

(c) The bank makes additional loans

Figure 7. The paper trail following open market purchases (repurchases) of securities by the Reserve Bank.

Other instruments of monetary control

South Africa's banking legislation, aside from the 2.5% of banks' total liabilities cash reserve requirement, also stipulates capital and liquid asset holdings requirements. However, these are by way of a prudential nature and are not really devices of monetary control.

Alternative monetary control measures could include prescribed credit limits or ceilings and deposit rate control, variations in exchange control regulations and central bank intervention in foreign exchange markets. Public debt management could also be harnessed as a tool of monetary policy. As an alternative to any formal monetary policy tools, the South African Reserve Bank could resort to consultation and persuasion as a means to influence commercial banks to follow a required policy direction. This approach has been termed "**moral suasion**".

Key Concepts and Summary

Central banks are at the heart of the financial/monetary systems of market economies. They have a unique function. South Africa's central bank is the South African Reserve Bank (SARB). The Reserve Bank's main objective is to achieve and maintain price stability in order to accommodate balanced and sustainable economic growth in South Africa. One of its most important functions is to formulate and conduct the country's monetary policy. Monetary policy in South Africa is conducted via the money market. The SARB has two main tools to conduct monetary policy: accommodation/refinancing policy and open market operations, which involves buying and selling government bonds with banks. The minimum cash reserve requirement makes open market operation effective. The most important monetary policy instrument/tool is accommodation/refinancing policy which comprises changes in the repo rate (the interest rate the SARB charges commercial banks). However, open market operations are used to support accommodation/refinancing policy.

Review Questions

Exercise 1

How is a central bank different from a typical commercial bank?

Exercise 2

Describe the two main tools at the South African Reserve Bank's disposal for conducting monetary policy.

Exercise 3

What components make up the total demand for money?

Exercise 4

What is meant by the "repo rate"?

Exercise 5

Describe how, and in what economic conditions, the South African Reserve Bank would employ accommodation/refinancing policy and open market policy to carry out expansionary monetary policy.

Exercise 6

If the central bank sells R5000 in bonds to a bank that has issued R10,000 in loans and is exactly meeting the reserve requirement of 10%, what will happen to the amount of loans and to the money supply in general?

Exercise 7

What would be the effect of increasing the reserve requirements of banks on the money supply?

Exercise 8

Explain what would happen if banks were notified they had to increase their required reserves by one percentage point from, say, 9% to 10% of deposits. What would their options be to come up with the cash?

Exercise 9

Suppose the South African Reserve Bank conducts an open market purchase by buying R10 million in Treasury bonds from Acme Bank. Sketch out the balance sheet changes that will occur as Acme converts the bond sale proceeds to new loans. The initial Acme bank balance sheet contains the following information: Assets – reserves R30 m, bonds R50 m, and loans R50; Liabilities – deposits R300 m and equity R30 m.

Exercise 10

Suppose the South African Reserve Bank conducts an open market sale by selling R10 million in Treasury bonds to Acme Bank. Sketch out the balance sheet changes that will occur as Acme restores its required reserves (10% of deposits) by reducing its loans. The initial balance sheet for Acme

Bank contains the following information: Assets – reserves R30 m, bonds R50 m, and loans R250 m; Liabilities – deposits R300 m and equity R30 m.

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Glossary

central bank

institution which conducts a nation's monetary policy and regulates its banking system

Monetary Policy and Economic Outcomes

By the end of this section, you will be able to:

- Contrast expansionary monetary policy and contractionary monetary policy
- Explain how monetary policy impacts interest rates and aggregate demand
- Evaluate Federal Reserve decisions over the last forty years
- Explain the significance of quantitative easing (QE)

A monetary policy that lowers interest rates and stimulates borrowing is known as an **expansionary monetary policy** or **loose monetary policy**. Conversely, a monetary policy that raises interest rates and reduces borrowing in the economy is a **contractionary monetary policy** or **tight monetary policy**. This module will discuss how expansionary and contractionary monetary policies affect interest rates and aggregate demand, and how such policies will affect macroeconomic goals like unemployment and inflation.

The Effect of Monetary Policy on Interest Rates

Consider the market for loanable bank funds, shown in Figure 1. The original equilibrium (E_0) occurs at an interest rate of 8% and a quantity of funds loaned and borrowed of R10 billion. An expansionary monetary policy will shift the supply of loanable funds to the right from the original supply curve S_0 to S_1 , leading to an equilibrium (E_1) with a lower interest rate of 6% and a quantity of funds loaned of R14 billion. Conversely, a contractionary monetary policy will shift the supply of loanable funds to the left from the original supply curve S_0 to S_2 , leading to an equilibrium (E_2) with a higher interest rate of 10% and a quantity of funds loaned of R8 billion.

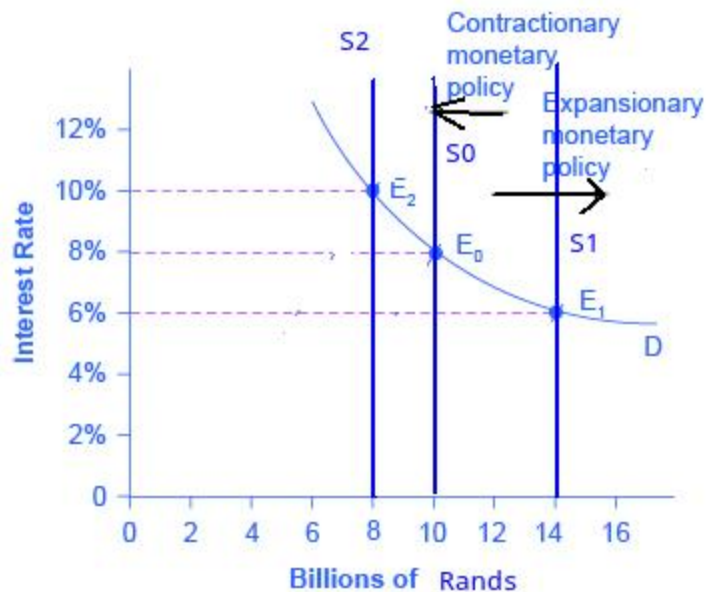


Figure 1: The original equilibrium occurs at E₀. An expansionary monetary policy will shift the supply of loanable funds to the right from the original supply curve (S₀) to the new supply curve (S₁) and to a new equilibrium of E₁, reducing the interest rate from 8% to 6%. A contractionary monetary policy will shift the supply of loanable funds to the left from the original supply curve (S₀) to the new supply (S₂), and raise the interest rate from 8% to 10%.

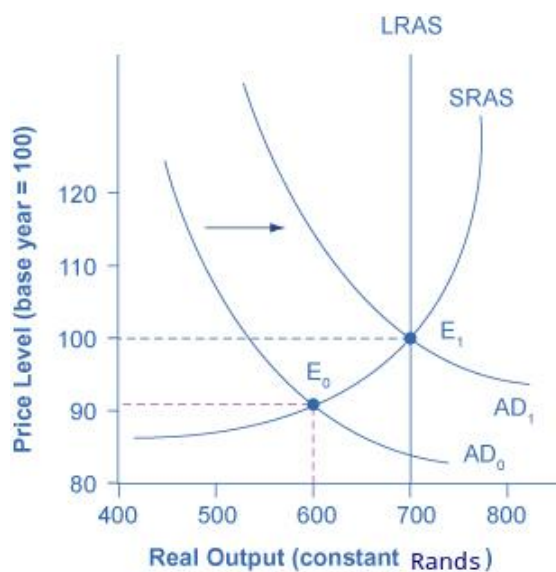
So how does a central bank “raise” interest rates? Well we saw in the section on monetary policy that, in the case of the South African Reserve Bank, the Monetary Policy Committee (MPC) simply takes a decision to do so! The SARB then carries out open market operations to support the accommodation/refinancing decision to increase or decrease the repo rate. Open market sales of securities will be undertaken to support a decision to increase the repo rate and, conversely, open market purchases of securities by the SARB will be offered to commercial banks to support a lower repo rate policy. Changes in the repo rate affect all other interest rates in the financial/monetary sector.

Of course, financial markets display a wide range of interest rates, representing borrowers with different risk premiums and loans that are to be repaid over different periods of time. In general, when the repo rate drops substantially, other interest rates drop, too, and when the repo rate rises, other interest rates rise. However, a fall or rise of one percentage point in the repo rate—which remember is for borrowing of not more than 7 days or so—will typically have an effect of less than one percentage point on a 30-year loan to purchase a house or a three-year loan to purchase a car. Monetary policy can push the entire spectrum of interest rates higher or lower, but the specific interest rates are set by the forces of supply and demand in those specific markets for lending and borrowing.

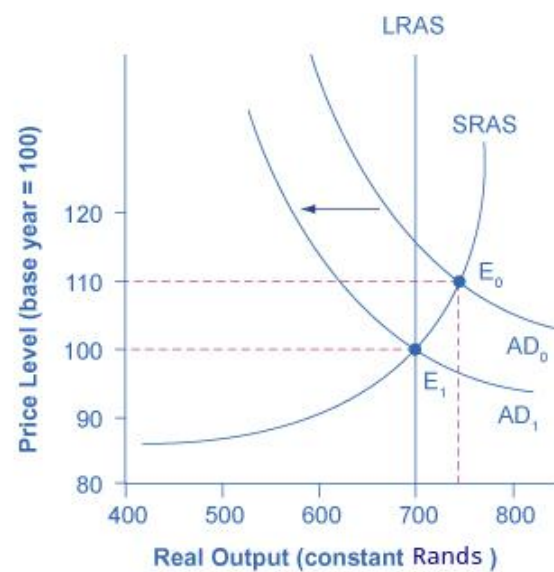
The Effect of Monetary Policy on Aggregate Demand

Monetary policy affects interest rates and the available quantity of loanable funds, which in turn affects several components of aggregate demand. Tight or contractionary monetary policy that leads to higher interest rates and a reduced quantity of loanable funds will reduce two components of aggregate demand. Business investment will decline because it is less attractive for firms to borrow money, and even firms that have money will notice that, with higher interest rates, it is relatively more attractive to put those funds in a financial investment than to make an investment in physical capital. In addition, higher interest rates will discourage consumer borrowing for big-ticket items like houses and cars. Conversely, loose or expansionary monetary policy that leads to lower interest rates and a higher quantity of loanable funds will tend to increase business investment and consumer borrowing for big-ticket items.

If the economy is suffering a recession and high unemployment, with output below potential GDP, expansionary monetary policy can help the economy return to potential GDP. Figure 2 (a) illustrates this situation. This example uses a short-run upward-sloping Keynesian aggregate supply curve (SRAS). The original equilibrium during a recession of E_0 occurs at an output level of 600. An expansionary monetary policy will reduce interest rates and stimulate investment and consumption spending, causing the original aggregate demand curve (AD_0) to shift right to AD_1 , so that the new equilibrium (E_1) occurs at the potential GDP level of 700.



(a) Expansionary monetary policy



(b) Contractionary monetary policy

Figure 2: (a) The economy is originally in a recession with the equilibrium output and price level shown at E_0 . Expansionary monetary policy will reduce interest rates and shift aggregate demand to the right from AD_0 to AD_1 , leading to the new equilibrium (E_1) at the potential GDP level of output with a relatively small rise in the price level. (b) The economy is originally producing above the potential GDP level of output at the equilibrium E_0 and is experiencing pressures for an inflationary rise in the price level. Contractionary monetary policy will shift aggregate demand to the left from AD_0 to AD_1 , thus leading to a new equilibrium (E_1) at the potential GDP level of output.

Conversely, if an economy is producing at a quantity of output above its potential GDP, a contractionary monetary policy can reduce the inflationary pressures for a rising price level. In Figure 2 (b), the original equilibrium

(E_0) occurs at an output of 750, which is above potential GDP. A contractionary monetary policy will raise interest rates, discourage borrowing for investment and consumption spending, and cause the original demand curve (AD_0) to shift left to AD_1 , so that the new equilibrium (E_1) occurs at the potential GDP level of 700.

These examples suggest that monetary policy should be **countercyclical**; that is, it should act to counterbalance the business cycles of economic downturns and upswings. Monetary policy should be loosened when a recession has caused unemployment to increase and tightened when inflation threatens. Of course, countercyclical policy does pose a danger of overreaction. If loose monetary policy seeking to end a recession goes too far, it may push aggregate demand so far to the right that it triggers inflation. If tight monetary policy seeking to reduce inflation goes too far, it may push aggregate demand so far to the left that a recession begins. Figure 3 (a) summarizes the chain of effects that connect loose and tight monetary policy to changes in output and the price level.

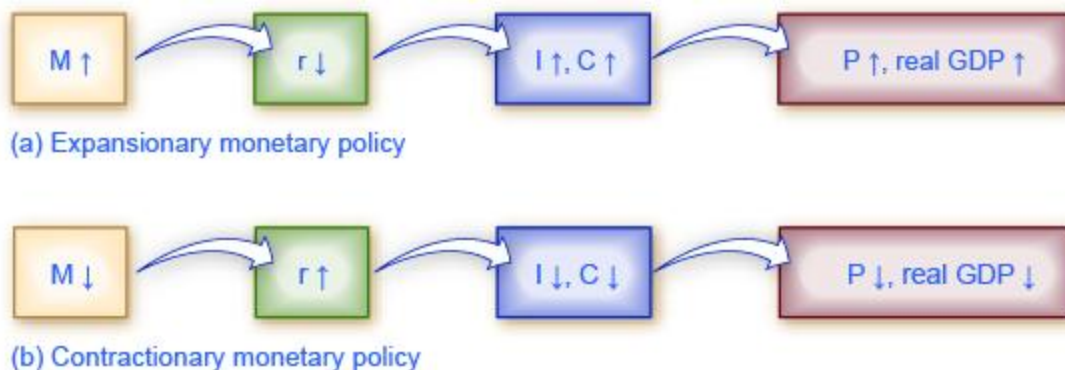


Figure 3: (a) In expansionary monetary policy the central bank causes the supply of money and loanable funds (M) to increase, which lowers the interest rate (r), stimulating additional borrowing for investment (I) and consumption (C), and shifting aggregate demand right. The result is

a higher price level (P) and, at least in the short run, higher real GDP. (b) In contractionary monetary policy, the central bank causes the supply of money and credit in the economy to decrease, which raises the interest rate, discouraging borrowing for investment and consumption, and shifting aggregate demand left. The result is a lower price level and, at least in the short run, lower real GDP.

Key Concepts and Summary

An expansionary (or loose) monetary policy raises the quantity of money and credit above what it otherwise would have been and reduces interest rates, boosting aggregate demand, and thus countering recession. A contractionary monetary policy, also called a tight monetary policy, reduces the quantity of money and credit below what it otherwise would have been and raises interest rates, seeking to hold down inflation. During the 2008–2009 recession, central banks around the world also used quantitative easing to expand the supply of credit.

Self-Check Questions

Exercise:

Problem:

Why does contractionary monetary policy cause interest rates to rise?

Solution:

Contractionary policy reduces the amount of loanable funds in the economy. As with all goods, greater scarcity leads to a greater price, so the interest rate, or the price of borrowing money, rises.

Exercise:

Problem:

Why does expansionary monetary policy causes interest rates to drop?

Solution:

An increase in the amount of available loanable funds means that there are more people who want to lend. They, therefore, bid the price of borrowing (the interest rate) down.

Review Questions**Exercise:****Problem:**

How do the expansionary and contractionary monetary policies affect the quantity of money?

Exercise:**Problem:**

How do tight and loose monetary policies affect interest rates?

Exercise:**Problem:**

How do expansionary, tight, contractionary, and loose monetary policies affect aggregate demand?

Exercise:**Problem:**

Which kind of monetary policy would you expect in response to high inflation: expansionary or contractionary? Why?

Exercise:

Problem:

Explain how to use quantitative easing to stimulate aggregate demand.

Critical Thinking Question**Exercise:****Problem:**

A well-known economic model called the Phillips Curve in The Keynesian Perspective chapter describes the short run trade-off typically observed between inflation and unemployment. Based on the discussion of expansionary and contractionary monetary policy, explain why one of these variables usually falls when the other rises.

Glossary

contractionary monetary policy

a monetary policy that reduces the supply of money and loans

countercyclical

moving in the opposite direction of the business cycle of economic downturns and upswings

expansionary monetary policy

a monetary policy that increases the supply of money and the quantity of loans

federal funds rate

the interest rate at which one bank lends funds to another bank overnight

loose monetary policy

see expansionary monetary policy

quantitative easing (QE)

the purchase of long term government and private mortgage-backed securities by central banks to make credit available in hopes of stimulating aggregate demand

tight monetary policy

see contractionary monetary policy

Introduction to International Trade

class="introduction"

Apple or Samsung iPhone?

While the iPhone is readily recognized as an Apple product, 26% of the component costs in it come from components made by rival phone-maker, Samsung. In international trade, there are often “conflicts” like this as each country or company focuses on what it does best.

(Credit: modification of work by Yutaka Tsutano
Creative Commons)

**Note:****Just Whose iPhone Is It?**

The iPhone is a global product. Apple does not manufacture the iPhone components, nor does it assemble them. The assembly is done by Foxconn Corporation, a Taiwanese company, at its factory in Sengzhen, China. But, Samsung, the electronics firm and competitor to Apple, actually supplies many of the parts that make up an iPhone—about 26%. That means, that Samsung is both the biggest supplier and biggest competitor for Apple. Why do these two firms work together to produce the iPhone? To understand the economic logic behind international trade, you have to accept, as these firms do, that trade is about mutually beneficial exchange. Samsung is one of the world's largest electronics parts suppliers. Apple lets Samsung focus on making the best parts, which allows Apple to concentrate on its strength—designing elegant products that are easy to use. If each company (and by extension each country) focuses on what it does best, there will be gains for all through trade.

Note:**Introduction to International Trade**

In this chapter, you will learn about:

- Absolute and Comparative Advantage
- What Happens When a Country Has an Absolute Advantage in All Goods
- Intra-industry Trade between Similar Economies
- The Benefits of Reducing Barriers to International Trade

We live in a global marketplace. The coffee you drink is likely to originate from Brazil or Kenya and the rice in your curry is probably from India. It is a strong possibility that the shoes you are wearing are from China or Vietnam. Your cell phone might have been made in Taiwan or South Korea. The clothes you wear might be designed in Italy and manufactured in China. The toys you give to a child might have come from India. The car you drive might come from Japan, Germany, or Korea. The fuel in the tank might be refined from crude oil from Saudi Arabia, Mexico, or Nigeria. As a worker, if your job is involved with farming, machinery, airplanes, cars, scientific instruments, or many other technology-related industries, the chances are good that a significant proportion of the sales of your employer—and hence the money that pays your salary—comes from export sales. We are all linked by international trade, and the volume of that trade has grown dramatically in the last few decades.

The first wave of globalization started in the nineteenth century and lasted up to the beginning of World War I. Over that time, global exports as a share of global GDP rose from less than 1% of GDP in 1820 to 9% of GDP in 1913. As the Nobel Prize-winning economist Paul Krugman wrote in 1995:

"It is a late-twentieth-century conceit that we invented the global economy just yesterday. In fact, world markets achieved an impressive degree of integration during the second half of the nineteenth century. Indeed, if one wants a specific date for the beginning of a truly global economy, one might

well choose 1869, the year in which both the Suez Canal and the Union Pacific railroad were completed. By the eve of the First World War steamships and railroads had created markets for standardized commodities, like wheat and wool, that were fully global in their reach. Even the global flow of information was better than modern observers, focused on electronic technology, tend to realize: the first submarine telegraph cable was laid under the Atlantic in 1858, and by 1900 all of the world's major economic regions could effectively communicate instantaneously." (Krugman: 1995: 330)

This first wave of globalization crashed to a halt in the beginning of the twentieth century. World War I severed many economic connections. During the Great Depression of the 1930s, many nations misguidedly tried to fix their own economies by reducing foreign trade with others. World War II further hindered international trade. Global flows of goods and financial capital rebuilt themselves only slowly after World War II. It was not until the early 1980s that global economic forces again became as important, relative to the size of the world economy, as they were before World War I.

References

Krugman, P. 1995. Growing world trade: causes and consequences. Brookings Papers on Economic Activity, 1: 330. Available: <http://math.stanford.edu/~lekheng/krugman/trade2.pdf> (Accessed: 1 Nov 2016)

Absolute and Comparative Advantage

By the end of this section, you will be able to:

- Define absolute advantage, comparative advantage, and opportunity costs
- Explain the gains of trade created when a country specializes

The American statesman Benjamin Franklin (1706–1790) once wrote: “No nation was ever ruined by trade.” Many economists, whether American or South African, would express their attitudes toward international trade in an even more positive manner. The evidence that international trade confers overall benefits on economies is pretty strong. Trade has accompanied economic growth in South Africa and around the world. Many of the national economies that have shown the most rapid growth in the last few decades—for example, Japan, South Korea, China, and India—have done so by dramatically orienting their economies toward international trade. There is no modern example of a country that has shut itself off from world trade and yet prospered. To understand the benefits of trade, or why we trade in the first place, we need to understand the concepts of comparative and absolute advantage.

In 1817, David Ricardo, a businessman, economist, and member of the British Parliament, wrote an essay called *On the Principles of Political Economy and Taxation*. In this paper, Ricardo argued that specialization and free trade benefit all trading partners, even those that may be relatively inefficient. To see what he meant, we must be able to distinguish between absolute and comparative advantage.

A country has an **absolute advantage** in producing a good over another country if it uses fewer resources to produce that good. Absolute advantage can be the result of a country’s natural endowment. For example, extracting oil in Saudi Arabia is pretty much just a matter of “drilling a hole.” Producing oil in other countries can require considerable exploration and costly technologies for drilling and extraction—if indeed they have any oil at all. South Africa, on the other hand, has some of the best farmland in the world for wine production making it easier to produce high quality wines than in many other countries. Guatemala and Colombia have climates

especially suited for growing coffee. Chile and Zambia have some of the world's richest copper mines. As some have argued, "geography is destiny." Chile will provide copper and Guatemala will produce coffee, and they will trade. When each country has a product others need and it can be produced with fewer resources in one country over another, then it is easy to imagine all parties benefiting from trade. However, thinking about trade just in terms of geography and absolute advantage is incomplete. Trade really occurs because of comparative (or relative) advantage.

A country has a comparative/relative advantage when a good can be produced at a lower cost in terms of other goods. The question each country or company should be asking when it trades is this: "What do we give up to produce this good?" It should be no surprise that the concept of comparative advantage is based on this idea of opportunity cost. For example, if Zambia focuses its resources on producing copper, its labor, land and financial resources cannot be used to produce other goods such as maize. As a result, Zambia gives up the opportunity to produce maize. How do we quantify the cost in terms of other goods? Simplify the problem and assume that Zambia just needs labor to produce copper and maize. The companies that produce either copper or maize tell you that it takes 10 hours to mine a ton of copper and 20 hours to harvest a bushel of maize. This means the opportunity cost of producing a ton of copper is 2 bushels of maize. The next section develops absolute and comparative advantage in greater detail and relates them to trade.

Note:

Visit this [website](#) for a list of articles and podcasts pertaining to international trade topics.



A Numerical Example of Absolute and Comparative Advantage

Consider a hypothetical world with just two countries, Saudi Arabia and South Africa, and two products, oil and maize. Further assume that consumers in both countries desire both these goods. These goods are homogeneous, meaning that consumers/producers cannot differentiate between maize or oil from either country. There is only one resource available in both countries, labor hours. Saudi Arabia can produce oil with fewer resources, while South Africa can produce maize with fewer resources. Table 1 illustrates the advantages of the two countries, expressed in terms of how many hours it takes to produce one unit of each good.

Country	Oil (hours per barrel)	Maize (hours per bushel)
Saudi Arabia	1	4
South Africa	2	1

How Many Hours It Takes to Produce Oil and Maize

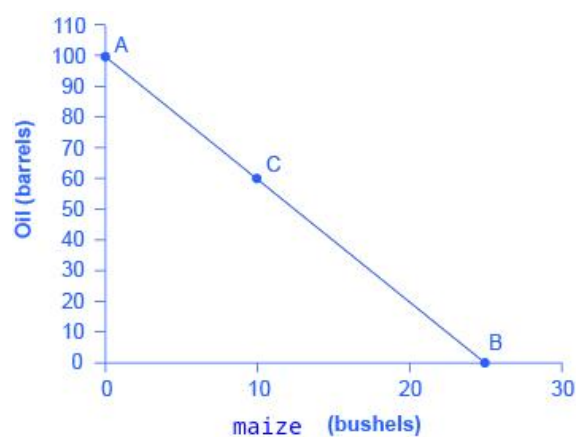
In Table 1, Saudi Arabia has an absolute advantage in the production of oil because it only takes an hour to produce a barrel of oil compared to two hours in South Africa. South Africa has an absolute advantage in the production of maize.

To simplify, let's say that Saudi Arabia and South Africa each have 100 worker hours (see Table 2). We illustrate what each country is capable of producing on its own using a production possibility frontier (PPF) graph,

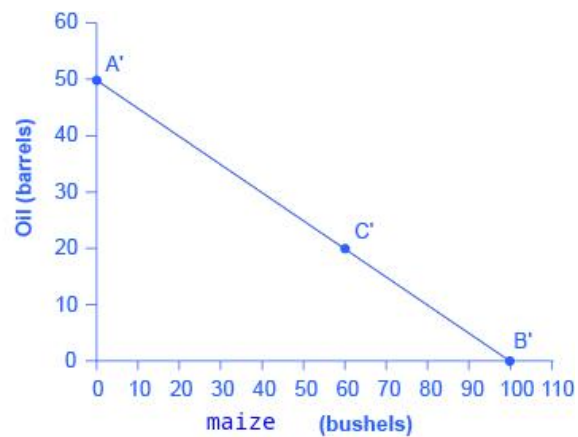
shown in Figure 1. Recall that the production possibilities frontier shows the maximum amount that each country can produce given its limited resources, in this case workers, and its level of technology.

Country	Oil Production using 100 worker hours (barrels)		Maize Production using 100 worker hours (bushels)
Saudi Arabia	100	or	25
South Africa	50	or	100

Production Possibilities before Trade



(a) Saudi Arabia



(b) South Africa

Figure 1: (a) Saudi Arabia can produce 100 barrels of oil at maximum and zero maize (point A), or 25

bushels of maize and zero oil (point B). It can also produce other combinations of oil and maize if it wants to consume both goods, such as at point C. Here it chooses to produce/consume 60 barrels of oil, leaving 40 work hours that can be allocated to producing 10 bushels of maize, using the data in Table 1. (b) If South Africa produces only oil, it can produce, at maximum, 50 barrels and zero maize (point A'), or at the other extreme, it can produce a maximum of 100 bushels of maize and no oil (point B'). Other combinations of both oil and maize are possible, such as point C'. All points above the frontiers are impossible to produce given the current level of resources and technology.

Arguably Saudi and South African consumers desire both oil and maize to live. Let's say that before trade occurs, both countries produce and consume at point C or C'. Thus, before trade, the Saudi Arabian economy will devote 60 worker hours to produce oil, as shown in Table 3. Given the information in Table 1, this choice implies that it produces/consumes 60 barrels of oil. With the remaining 40 worker hours, since it needs four hours to produce a bushel of maize, it can produce only 10 bushels. To be at point C', the South African economy devotes 40 worker hours to produce 20 barrels of oil and the remaining worker hours can be allocated to produce 60 bushels of maize.

Country	Oil Production (barrels)	Maize Production (bushels)
Saudi Arabia (C)	60	10

Country	Oil Production (barrels)	Maize Production (bushels)
South Africa (C')	20	60
Total World Production	80	70

Production before Trade

The slope of the production possibility frontier illustrates the opportunity cost of producing oil in terms of maize. Using all its resources, South Africa can produce 50 barrels of oil *or* 100 bushels of maize. So the opportunity cost of one barrel of oil is two bushels of maize—or the slope is $1/2$. Thus, in the South African production possibility frontier graph, every increase in oil production of one barrel implies a decrease of two bushels of maize. Saudi Arabia can produce 100 barrels of oil *or* 25 bushels of maize. The opportunity cost of producing one barrel of oil is the loss of $1/4$ of a bushel of maize that Saudi workers could otherwise have produced. In terms of maize, notice that Saudi Arabia gives up the least to produce a barrel of oil. These calculations are summarized in Table 4.

Country	Opportunity cost of one unit — Oil (in terms of maize)	Opportunity cost of one unit — Maize (in terms of oil)
Saudi Arabia	$\frac{1}{4}$	4
South Africa	2	$\frac{1}{2}$

Opportunity Cost and Comparative Advantage

Again recall that comparative advantage was defined as the opportunity cost of producing goods. Since Saudi Arabia gives up the least to produce a barrel of oil, ($\frac{1}{4} < 2$ in Table 4 it has a comparative advantage in oil production. South Africa gives up the least to produce a bushel of maize, so it has a comparative advantage in maize production.

In this example, there is symmetry between absolute and comparative advantage. Saudi Arabia needs fewer worker hours to produce oil (absolute advantage, see Table 1), and also gives up the least in terms of other goods to produce oil (comparative advantage, see Table 4). Such symmetry is not always the case, as we will show after we have discussed gains from trade fully. But first, read the following Clear It Up feature to make sure you understand why the PPF line in the graphs is straight.

Note:

Can a production possibility frontier be straight?

When you first met the production possibility frontier (PPF) in an earlier chapter it was drawn with an outward-bending shape. This shape illustrated that as inputs were transferred from producing one good to another—like from education to health services—there were increasing opportunity costs. In the examples in this chapter, the PPFs (or PPCs) are drawn as straight lines, which means that opportunity costs are constant. When a marginal unit of labor is transferred away from growing maize and toward producing oil, the decline in the quantity of maize and the increase in the quantity of oil is always the same. In reality this is possible only if the contribution of additional workers to output did not change as the scale of production changed. The linear production possibilities frontier is a less realistic model, but a straight line simplifies calculations. It also illustrates economic themes like absolute and comparative advantage just as clearly.

Gains from Trade

Consider the trading positions of South Africa and Saudi Arabia after they have specialized and traded. Before trade, Saudi Arabia produces/consumes 60 barrels of oil and 10 bushels of maize. South Africa produces/consumes 20 barrels of oil and 60 bushels of maize. Given their current production levels, if South Africa can trade an amount of maize fewer than 60 bushels and receives in exchange an amount of oil greater than 20 barrels, it will **gain from trade**. With trade, South Africa can consume more of both goods than it did without specialization and trade. Recall that **specialization** in economics refers to firms and workers focussing their efforts on the production of specific commodities, for example, either maize **or** oil (not both). Specialization is also used to describe the occurrence when a country shifts resources to focus on producing a good that offers comparative advantage.) Similarly, if Saudi Arabia can trade an amount of oil less than 60 barrels and receive in exchange an amount of maize greater than 10 bushels, it will have more of both goods than it did before specialization and trade. Table 5 illustrates the range of trades that would benefit both sides.

South African Economy, after Specialization, Will Benefit If It:	The Saudi Arabian Economy, after Specialization, Will Benefit If It:
Exports no more than 60 bushels of maize	Imports at least 10 bushels of maize
Imports at least 20 barrels of oil	Exports less than 60 barrels of oil

The Range of Trades That Benefit Both South Africa and Saudi Arabia

The underlying reason why trade benefits both sides is rooted in the concept of opportunity cost, as the following Clear It Up feature explains. If Saudi

Arabia wishes to expand domestic production of maize in a world without international trade, then based on its opportunity costs it must give up four barrels of oil for every one additional bushel of maize. If Saudi Arabia could find a way to give up less than four barrels of oil for an additional bushel of maize (or equivalently, to receive more than one bushel of maize for four barrels of oil), it would be better off.

Note:

What are the opportunity costs and gains from trade?

The range of trades that will benefit each country is based on the country's opportunity cost of producing each good. South Africa can produce 100 bushels of maize or 50 barrels of oil. So, for South Africa, the opportunity cost of producing one barrel of oil is two bushels of maize. If we divide the numbers above by 50, we get the same ratio: one barrel of oil is equivalent to two bushels of maize, or $(100/50 = 2$ and $50/50 = 1)$. In a trade with Saudi Arabia, if South Africa is going to give up 100 bushels of maize in exports, it must import at least 50 barrels of oil to be just as well off. Clearly, to gain from trade it needs to be able to gain more than a half barrel of oil for its bushel of maize—or why trade at all?

Recall that David Ricardo argued that if each country specializes in its comparative advantage, it will benefit from trade, and total global output will increase. How can we show gains from trade as a result of comparative advantage and specialization? Table 6 shows the output assuming that each country specializes in its comparative advantage and produces no other good. This is 100% specialization. Specialization leads to an increase in total world production. (Compare the total world production in Table 3 to that in Table 6)

Country	Quantity produced after 100% specialization — Oil (barrels)	Quantity produced after 100% specialization — Maize (bushels)
Saudi Arabia	100	0
South Africa	0	100
Total World Production	100	100

How Specialization Expands Output

What if we did not have complete specialization, as in Table 6? Would there still be gains from trade? Consider another example, such as when South Africa and Saudi Arabia start at C and C', respectively, as shown in Figure 2 (we need show only Saudi Arabia's PPF/PPC to make the point). Assume now that trade is allowed and South Africa exports 20 bushels of maize to Saudi Arabia in exchange for 20 barrels of oil.

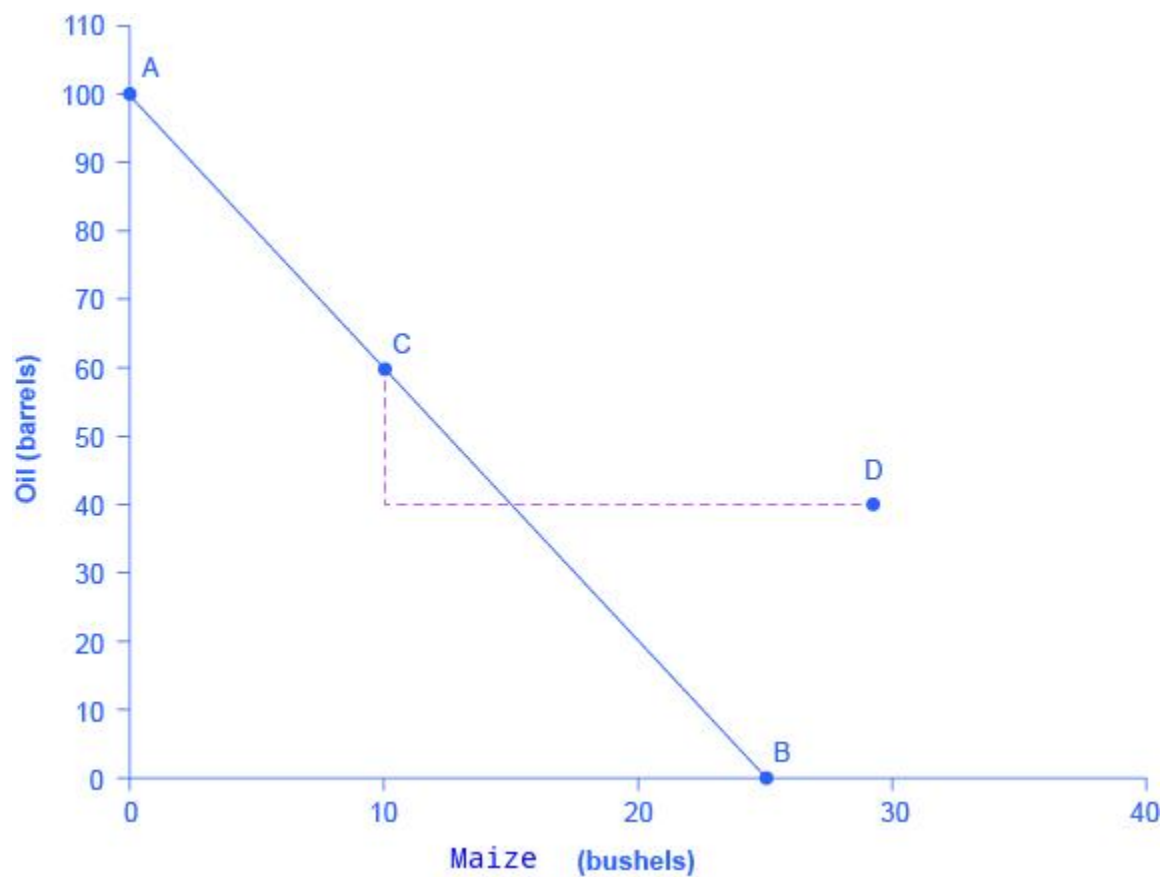


Figure 2: Gains from trade of oil can increase only by achieving less from trade of maize. So if Saudi Arabia can benefit only at the expense of South Africa. The opposite is true as well: The more gains from trade of maize, the fewer gains from trade of oil. In this case South Africa can get more oil only if Saudi Arabia is willing to accept less maize in exchange. This ratio of export prices to import prices is referred to as the **"terms of trade"**.

Starting at point C, reduce Saudi Oil production by 20 and exchange it for 20 units of maize to reach point D (see Figure 2). Notice that even without 100% specialization, if the “trading price,” in this case 20 barrels of oil for 20 bushels of maize, is greater than the country’s opportunity cost, the Saudis will gain from trade. Indeed both countries consume more of both goods after specialized production and trade occurs. Refer to Table 1 to

check that Saudi Arabia can afford to pay just short of 4 bushels (but not exactly 4) of maize per barrel of oil to continue benefiting from trade. South Africa, in turn, can pay up to just short of 2 barrels of oil (but not exactly 2 barrels) to still benefit from trade. So 1 barrel of oil for 1 bushel of maize is very much favorable to both countries and a much cheaper option than each country trying to produce both commodities.

Key Concepts and Summary

A country has an absolute advantage in those products in which it has a productivity edge over other countries; it takes fewer resources to produce a product. A country has a comparative advantage when a good can be produced at a lower cost in terms of other goods. Countries that specialize based on comparative advantage gain from trade.

Self-Check Questions

Exercise:

Problem:

True or False: The source of comparative advantage must be natural elements like climate and mineral deposits. Explain.

Solution:

False. Anything that leads to different levels of productivity between two economies can be a source of comparative advantage. For example, the education of workers, the knowledge base of engineers and scientists in a country, the part of a split-up value chain where they have their specialized learning, economies of scale, and other factors can all determine comparative advantage.

Exercise:

Problem:

Brazil can produce 100 Kg of beef or 10 cars; in contrast South Africa can produce 40 Kg of beef or 30 cars. Which country has the absolute advantage in beef? Which country has the absolute advantage in producing cars? What is the opportunity cost of producing one Kg of beef in Brazil? What is the opportunity cost of producing one Kg of beef in South Africa?

Solution:

Brazil has the absolute advantage in producing beef and South Africa has the absolute advantage in cars. The opportunity cost of producing one Kg of beef is 1/10 of a car; in South Africa it is 3/4 of a car.

Exercise:**Problem:**

In France it takes one worker to produce one sweater, and one worker to produce one bottle of wine. In Tunisia it takes two workers to produce one sweater, and three workers to produce one bottle of wine. Who has the absolute advantage in production of sweaters? Who has the absolute advantage in the production of wine? How can you tell?

Solution:

In answering questions like these, it is often helpful to begin by organizing the information in a table, such as in the following table. Notice that, in this case, the productivity of the countries is expressed in terms of how many workers it takes to produce a unit of a product.

Country	One Sweater	One Bottle of wine
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Country	One Sweater	One Bottle of wine
France	1 worker	1 worker
Tunisia	2 workers	3 workers

In this example, France has an absolute advantage in the production of both sweaters and wine. You can tell because it takes France less labor to produce a unit of the good.

Review Questions

Exercise:

Problem:

What is absolute advantage? What is comparative advantage?

Exercise:

Problem:

Under what conditions does comparative advantage lead to gains from trade?

Exercise:

Problem:

What factors does the economist Paul Krugman identify that supported the expansion of international trade in the 1800s (refer to the previous section "Introduction to international trade")?

Critical Thinking Questions

Exercise:

Problem:

Are differences in geography behind the differences in absolute advantages?

Exercise:**Problem:**

Why does South not have an absolute advantage in the production of computer technology and equipment?

Exercise:**Problem:**

Look at Exercise 2. Compute the opportunity costs of producing sweaters and wine in both France and Tunisia. Who has the lowest opportunity cost of producing sweaters and who has the lowest opportunity cost of producing wine? Explain what it means to have a lower opportunity cost.

Problems**Exercise:****Problem:**

France and Tunisia both have Mediterranean climates that are excellent for producing/harvesting green beans and tomatoes. In France it takes two hours for each worker to harvest green beans and two hours to harvest a tomato. Tunisian workers need only one hour to harvest the tomatoes but four hours to harvest green beans. Assume there are only two workers, one in each country, and each works 40 hours a week.

- a. Draw a production possibilities frontier for each country. *Hint:* Remember the production possibility frontier is the maximum that all workers can produce at a unit of time which, in this problem, is a week.

- b. Identify which country has the absolute advantage in green beans and which country has the absolute advantage in tomatoes.
- c. Identify which country has the comparative advantage.
- d. How much would France have to give up in terms of tomatoes to gain from trade? How much would it have to give up in terms of green beans?

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Ricardo, D. 1817. *On the Principles of Political Economy and Taxation*. London: John Murray. Available:
<http://www.econlib.org/library/Ricardo/ricP.html> (Accessed: 1 Nov 2016)

Glossary

absolute advantage

when one country can use fewer resources to produce a good compared to another country; when a country is more productive compared to another country

gain from trade

a country that can consume more than it can produce as a result of specialization and trade

The Benefits of Reducing Barriers to International Trade

By the end of this section, you will be able to:

- Explain tariffs as barriers to trade
- Identify at least two benefits of reducing barriers to international trade



Figure 1.

In spite of the benefits of international trade that are suggested by the principle of comparative (or relative advantage), countries sometimes go to considerable lengths to prevent such trade for a variety of reasons. These include concerns about local unemployment as cheaper imports displace locally produced goods and services, political disagreements and environmental concerns among others. We will look at these issues in more detail in the following chapter. However, we first examine the benefits of reducing impediments to international trade before we consider why it may sometimes be justified to limit or even prevent imports.

Tariffs are taxes that governments place on imported goods for a variety of reasons. Some of these reasons include protecting sensitive industries, for humanitarian reasons, and protecting against dumping. Traditionally, tariffs were used simply as a political tool to protect certain vested economic, social, and cultural interests. The World Trade Organization (WTO) is committed to lowering barriers to trade. The world's nations meet through the WTO to negotiate how they can reduce barriers to trade, such as tariffs. WTO negotiations happen in "rounds," where all countries negotiate one agreement to encourage trade, take a year or two off, and then start negotiating a new agreement. The current round of negotiations is called the Doha Round because it was officially launched in Doha, the capital city of Qatar, in November 2001. In 2009, economists from the World Bank summarized recent research and found that the Doha round of negotiations would increase the size of the world economy by \$160 billion to \$385 billion per year, depending on the precise deal that ended up being negotiated. (World Trade Organization: 2016)

In the context of a global economy that currently produces more than \$30 trillion of goods and services each year, this amount is not huge: it is an increase of 1% or less. But before dismissing the gains from trade too quickly, it is worth remembering two points.

- First, a gain of a few hundred billion dollars is enough money to deserve attention! Moreover, remember that this increase is not a one-time event; it would persist each year into the future.
- Second, the estimate of gains may be on the low side because some of the gains from trade are not measured especially well in economic statistics. For example, it is difficult to measure the potential advantages to consumers of having a variety of products available and a greater degree of competition among producers. Perhaps the most important unmeasured factor is that trade between countries, especially when firms are splitting up the value chain of production, often involves a transfer of knowledge that can involve skills in production, technology, management, finance, and law.

Low-income countries benefit more from trade than high-income countries do. In some ways, the giant United States economy has less need for

international trade, because it can already take advantage of internal trade within its economy. However, many smaller national economies around the world, in regions like Africa, Latin America, the Middle East, and Asia, have much more limited possibilities for trade inside their countries or their immediate regions. Without international trade, they may have little ability to benefit from comparative advantage or from economies of scale that could arise from outsourcing some production processes to low-income countries. Moreover, smaller economies often have fewer competitive firms making goods within their economy, and thus firms have less pressure from other firms to provide the goods and prices that consumers want.

The economic gains from expanding international trade are measured in hundreds of billions of dollars, and the gains from international trade as a whole probably reach well into the trillions of dollars. The potential for gains from trade may be especially high among the smaller and lower-income countries of the world.

From Interpersonal to International Trade

Most people find it easy to believe that they, personally, would not be better off if they tried to grow and process all of their own food, to make all of their own clothes, to build their own cars and houses from scratch, and so on. Instead, we all benefit from living in economies where people and firms can specialize and trade with each other.

The benefits of trade do not stop at national boundaries, either. Earlier we explained that the division of labor could increase output for three reasons: (1) workers with different characteristics can specialize in the types of production where they have a comparative advantage; (2) firms and workers who specialize in a certain product become more productive with learning and practice; and (3) economies of scale. These three reasons apply from the individual and community level right up to the international level. If it makes sense to you that interpersonal, intercommunity, and interprovincial trade offer economic gains, it should make sense that international trade offers gains, too.

International trade currently involves about \$20 trillion worth of goods and services moving around the globe. Any economic force of that size, even if it confers overall benefits, is certain to cause disruption and controversy. This chapter has only made the case that trade brings economic benefits. The following chapter considers public policy arguments over whether to restrict international trade.

Note:

It's Apple's (Global) iPhone

Apple Corporation uses a global platform to produce the iPhone. Now that you understand the concept of comparative advantage, you can see why the engineering and design of the iPhone is done in the United States. The United States has built up a comparative advantage over the years in designing and marketing products, and sacrifices fewer resources to design high-tech devices relative to other countries. China has a comparative advantage in assembling the phone due to its large skilled labor force. Korea has a comparative advantage in producing components. Korea focuses its production by increasing its scale, learning better ways to produce screens and computer chips, and uses innovation to lower average costs of production. Apple, in turn, benefits because it can purchase these quality products at lower prices. Put the global assembly line together and you have the device with which we are all so familiar.

The Balance of Payments

Every country keeps an accounting record of its transactions with the rest of the world which is referred to as the **balance of payments**. South Africa's balance of payments record is compiled and maintained by the South African Reserve Bank (SARB). It records the transactions of domestic households, firms and government with foreign households, firms and governments. The two primary accounts that constitute the balance of payments include the **current account** and the **financial account**.

The current account

The current account has three sub accounts: the **trade balance**, the **services balance** and the **income balance**. The trade balance reflects the net Rand value of merchandise exports and imports (that is, exports less imports) for the period (usually a year) in question. Note that gold exports and imports are included in the trade balance. The services balance reflects net flows of payments for services such as international transportation including travel and tourism, recreational services, insurance and financial services, professional and technical services as well as government services.

The income balance reflects net income payments, that is, foreign income receipts of South African residents less payments of income to non-residents of South Africa who have nonetheless earned this income in the country and then repatriate it to their home countries. Payments of income may be in the form of salaries and/or investment income earned in countries in which they are not resident. Investment income may include dividends, interest and profits among other forms of investment income. The current account also includes an item called **current transfers** which accounts for net payments of social security contributions and benefits (e.g. pension payments and various types of grants), gifts of money and donations (Mohr: 2015).

The Financial Account

The financial account of the balance of payments records international transactions in assets and liabilities and, like the current account, also has three sub accounts: direct investment, portfolio investment and "other" investment. **Direct investment** refers to establishing business operations or acquiring business assets in a foreign country including ownership or controlling interests in a company. **Portfolio investment** is investment not directly associated with the ownership, control or management of foreign companies. It refers to the purchase of foreign securities such as shares, bonds and other financial instruments. **Other investment** is a collective term for investments not included in direct or portfolio investment and is made up of primarily loans, currency and deposits (Mohr: 2015). Table 1 gives a summary breakdown of South Africa's balance of payments for the first quarters of 2015 and 2016 respectively.

Table 1 shows that the small financial balance surplus in Quarter 1 (2016) of R27.6 billion was overshadowed by a much larger current account deficit of R211 billion. (South African Reserve Bank: 2016). While Table 1 does not provide sufficient detail to compute the exact balance of payments for either year (the capital transfer account values and unrecorded transactions have not been included), it is safe to conclude that in Quarter 1 of both 2015 and 2016 South Africa experienced overall balance of payments deficits. In fact this is a general trend for South Africa: historically it tends to experience significant current account deficits.

Current account	Quarter 1, 2015 (Rbn)	Quarter 1, 2016 (Rbn)
Merchandise exports	940	995
Net gold exports	63	78
Merchandise imports	-1070	-1110
Trade balance	-68	-38
Net service, income and current transfer payment	-134	-174
Balance on current account	-202	-211
Financial account		
Net direct investment	-25.2	-10.6
Net portfolio investment	34	21.5
Net other investment	22	12.4
Reserve assets	12.3	4.2
Balance on financial account	43	27.6

Table 1. A Summary Comparison of South Africa's Balance of Payments as at Quarter 1 of 2015 and 2016. (Source: South African Reserve Bank: 2016)

Gold and Foreign Reserves

Balance of payments surpluses (inflows greater than outflows) will increase the country's holdings of gold (which is also used by countries to service payments) and reserves of foreign currencies. Balance of payments deficits (inflows less than outflows) will, on the other hand, serve to decrease its holdings of gold and foreign reserves. In theory a balance of payments surplus should, in monetary value terms, produce an identical change (that is, increase) in the monetary value of the country's gold and foreign

reserves. Similarly, a balance of payments deficit should, in monetary value terms, be exactly reflected in an identical decrease in the value of the country's gold and foreign reserves. However, without some accounting trickery, this is not usually the case due to the many **unrecorded transactions** that get missed in an international accounting exercise of this magnitude.

Unrecorded Transactions

The balance of payments account comprises the current account, the financial account, the capital transfer account (which is not important for our purposes and so is not discussed any further in this book) and **unrecorded transactions**. This is an accounting device (or trick!) to make sure the balance of payments actually balances. So, because the South African Reserve Bank employs a double-entry accounting system in compiling its accounts, one would expect that the net value of the debit and credit entries flowing from the current and financial accounts would be equal to the change in the country's net gold and foreign reserves. So, for example, a balance of payments deficit of R70 billion should be exactly matched by a decrease in the country's gold and foreign reserves of R70 billion. Similarly, a balance of payments surplus should increase gold and foreign reserve holdings by an amount exactly equal to the value of the surplus. However, this is not the case in our imperfect world (where errors and complications abound) and so hence the **unrecorded transactions** balancing item.

The Balance of Payments Constraint on Economic Growth

Recurring balance of payments deficits, as in the case of South Africa, act as a brake on domestic economic growth. This is due to the structure of the country's economy which is heavily reliant on important imports such as capital (including technology) and commodities such as fuel. South Africa has a notoriously low domestic savings rate which leaves the country dependent on foreign financial capital to fund investment. And if export and other foreign income (current account) revenues do not cover imports and foreign income payments (current account) then any shortfall/deficit must be funded from the financial account surpluses or from the country's gold and foreign reserves holdings.

So imagine now that South Africa's monetary authorities wish to pursue looser (or expansionary) monetary policy to fight a recession. Accordingly the repo rate is reduced, signalling cheaper credit to commercial banks and their clients. The hope, of course, is that higher levels of borrowing and spending will induce increases in domestic production. However, increased production will first require more investment and capital (machines, equipment and technology which are mostly imported), fuel and other specialized inputs (also mostly imported). So if inflows on the current and financial accounts are less than the outflows on these accounts, and gold and foreign reserves holdings are depleted, the resulting deficit will mean that the vital imports on which increased domestic production and hence economic growth depend cannot be funded. The balance of payments constraint can thus also render monetary and fiscal policy (especially **expansionary** economic policy) ineffective. It just will not work!

The Foreign Exchange Market

A **foreign exchange market** is where one currency is traded for another. There is a demand for each currency and a supply of each currency. In these markets, one currency is bought using another. The price of one currency in terms of another (for example, how many Rands it costs to buy one Euro) is called the exchange rate. Figure 2 represents the Rand/Euro foreign exchange market.

The Demand for Foreign Currency

Foreign currencies are demanded by domestic households, firms, and governments that wish to purchase goods, services, or financial assets denominated in the currency of another economy. For example, if a South African motor vehicle importer wants to buy a German car (a current account transaction), the importer must buy euros. The law of demand holds: as the price of a foreign currency increases, the quantity of that currency demanded will decrease. Another source of demand for Euros could be South African firms wanting to invest in Europe. They would need to purchase Euros to pay for their investment purchases in Germany, France and other countries in the Euro area (financial account transactions). Yet another source of demand for Euros may be Europeans who have investments in South Africa. Should they wish to sell their local

investments they will have to use their Rand proceeds to purchase Euros for use in their home countries (financial account transactions).

The Supply of Foreign Currency

Foreign currencies are supplied by foreign households, firms, and governments that wish to purchase goods, services, or financial assets denominated in the domestic currency. For example, if a French bank wants to buy a South African government bond or shares in ABSA Bank which is listed on the Johannesburg Stock Exchange (JSE), the bank must first sell Euros to buy Rands (financial account transactions) since South African securities are priced in Rands (ZAR). Alternatively, South Africans that have investments in France and other Euro areas may wish to sell up and return to South Africa (also financial account transactions). They would have to supply their Euro proceeds to purchase Rands. On the current account South African exporters to the Euro area would be paid for their merchandise in Euros which would then be sold to purchase Rands to meet their costs in South Africa (current account transactions). As the price of a foreign currency increases, the quantity supplied of that currency increases.

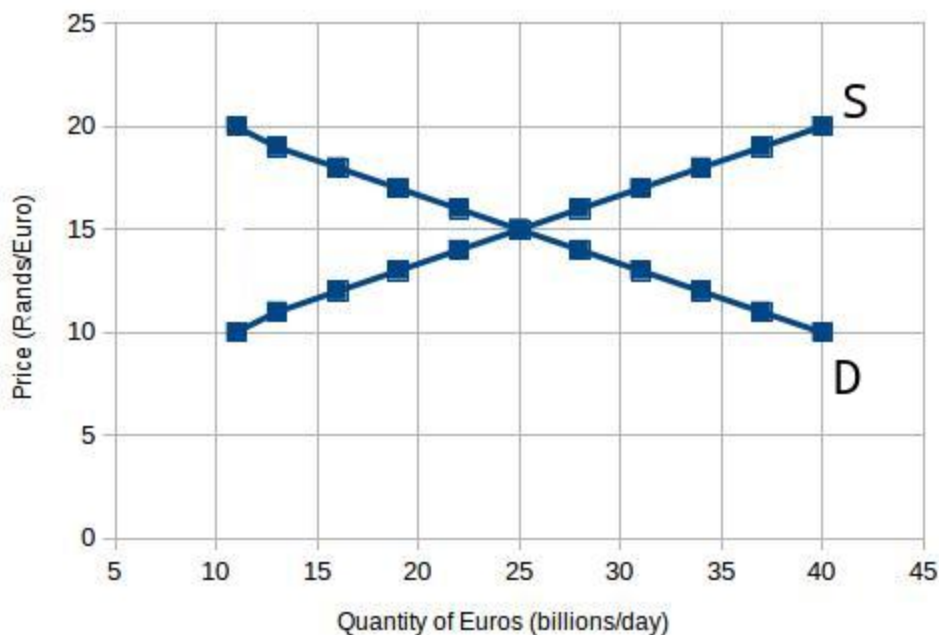


Figure 2. The Rand/Euro Foreign Exchange Market.

Key Concepts and Summary

Tariffs are placed on imported goods as a way of protecting sensitive industries, for humanitarian reasons, and for protection against dumping. Traditionally, tariffs were used as a political tool to protect certain vested economic, social, and cultural interests. The World Trade Organization (WTO) has been, and continues to be, a way for nations to meet and negotiate through barriers to trade. The gains of international trade are very large, especially for smaller countries, but are beneficial to all.

A country's balance of payments account records the transactions of domestic households, firms and government with foreign households, firms and governments. The main accounts that constitute South Africa's record of transactions with the rest of the world are the current account and the financial account. Balance of payments transactions are effected through the foreign exchange market.

Self-Check Question

Exercise:

Problem:

If the removal of trade barriers is so beneficial to international economic growth, why would a nation continue to restrict trade on some imported or exported products?

Solution:

A nation might restrict trade on imported products to protect an industry that is important for national security. For example, nation X and nation Y may be geopolitical rivals, each with ambitions of increased political and economic strength. Even if nation Y has comparative advantage in the production of missile defense systems, it

is unlikely that nation Y would seek to export those goods to nation X. It is also the case that, for some nations, the production of a particular good is a key component of national identity. In Japan, the production of rice is culturally very important. It may be difficult for Japan to import rice from a nation like Vietnam, even if Vietnam has a comparative advantage in rice production.

Review Question

Exercise:

Problem:

Are the gains from international trade more likely to be relatively more important to large or small countries?

Critical Thinking Questions

Exercise:

Problem:

In World Trade Organization meetings, what do you think low-income countries lobby for?

Exercise:

Problem:

Why might a low-income country put up barriers to trade, such as tariffs on imports?

Exercise:

Problem:

Can a nation's comparative advantage change over time? What factors would make it change?

Problems

Exercise:

Problem:

If trade increases world GDP by 1% per year, what is the global impact of this increase over 10 years? How does this increase compare to the annual GDP of a country like South Africa? Discuss. *Hint:* To answer this question, here are steps you may want to consider. Go to the World Development Indicators (online) published by the World Bank. It may take some time to download the Excel file. Find the current level of World GDP in constant international dollars. Also, find the GDP of South Africa in constant international dollars. Once you have these two numbers, compute the amount the additional increase in global incomes due to trade and compare that number to South Africa's GDP.

Exercise 7

Table 2 below reflects balance of payments account data for a large island economy that uses the Rand as its currency. Use it to compute the current account and financial account balances. What is the overall balance of payments and hence the change in net gold and foreign reserves owing to international trade and investment in 2016 for this economy?

Current Account	2016 (R millions)
Merchandise exports	874 811
Service receipts	130 000
Income receipts	50 000
less: Merchandise imports	750 000
less: Payments for services	150 000
less: Income payments	130 000
Current transfers (net receipts shown as +)	40 000
Balance on current account	?
Capital transfer account	250
Financial account	
Net direct investment	18 000
Net portfolio investment	60 000
Net other investment	100 000
Balance on financial account	?
Unrecorded transactions	2 000
Change in net gold and foreign reserves owing to balance of payments transactions	

Table 2. Island economy's balance of payments.

Exercise 8

Refer to Table 3 (which reflects the foreign exchange market in a large island economy that uses the Rand as its currency) to help you answer this question. Assume that political instability in this island country causes European investors to withdraw their funds for reinvestment in their own countries. Would the Euro appreciate or depreciate in value? Would the Rand appreciate or depreciate in value? If, as a result of political disruption, the trade in Euros increased by roughly 3 million per day what would the new **approximate** exchange rate be?

Price (Rands/Euro)	Quantity supplied (Euros/day)	Quantity demanded (Euros/day)
9	3 000	27 000
10	6 000	24 000
11	9 000	21 000
12	12 000	18 000
13	15 000	15 000
14	18 000	12 000
15	21 000	9 000
16	24 000	6 000
17	27 000	3 000

Table 3. The Rand/Euro market.

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Glossary

tariffs

taxes that governments place on imported goods

Introduction to Globalization and Protectionism
class="introduction"
Poultry Production Competition



Figure 1. South African chicken farmers must compete with poultry imports from America. (Credit: Lastras: 2009)

Note:

What's the Downside of Protection?

Governments are motivated to limit and alter market outcomes for political or social ends. While governments can limit the rise in prices of some products, they cannot control how much people want to buy or how much firms are willing to sell. The laws of demand and supply still hold. Trade policy is an example where regulations can redirect economic forces, but it cannot stop them from manifesting themselves elsewhere.

A condition of South Africa's inclusion in the new African Growth and Opportunity Act (AGOA) is that American chicken, pork and beef imports be allowed into South Africa. Accordingly, in June 2015 South Africa agreed to the tariff free import of 65 000 metric tons of American chicken (Unwanted American chicken dumped in South Africa: 2016). However, United States consumers prefer chicken breast meat and wings and regard the leg quarter (thigh and drumstick) as by-products which are exported to South Africa at "dumping" prices. These below-cost (or less-than-fair) prices undercut South African chicken farmers and this poses a threat to their livelihoods and those of their employees. So an argument could be made for protecting local chicken farmers from what seems to be unfair trade practices (that is, anti-dumping policy). However, what would be the cost of such trade protectionism?

Note:

Introduction to Globalism and Protectionism

In this chapter, you will learn about:

- Protectionism: An Indirect Subsidy from Consumers to Producers
- International Trade and Its Effects on Jobs, Wages, and Working Conditions
- Arguments in Support of Restricting Imports

The world has become more connected on multiple levels, especially economically. Historically South Africa has always enjoyed strong trade relations with the rest of the world with exports and imports being well in excess of 20% since at least 1960 (World Bank: 2016a; World Bank: 2016b). Currently imports and exports average between 30-31% of GDP (similar to the USA) which is much higher than some countries like Brazil whose exports in 2015 amounted to just 13% of its GDP (World Bank: 2016a) and imports valued at 14% of GDP (World Bank: 2016b). Countries like Botswana, on the other hand, depend to a much greater extent than South Africa on international trade with their imports and exports both

averaging about 50% of GDP (World Bank: 2016a; World Bank: 2016b). This chapter explores trade policy—the laws and strategies a country uses to regulate international trade. This topic is not without controversy.

As the world has become more globally connected, firms and workers in high-income countries like the United States, Japan, or the nations of the European Union, perceive a competitive threat from firms in medium-income countries like South Africa, Mexico or China that have lower costs of living and therefore pay lower wages. Firms and workers in low-income countries fear that they will suffer if they must compete against more productive workers and advanced technology in high-income countries.

On a different tack, some environmentalists worry that multinational firms may evade environmental protection laws by moving their production to countries with loose or nonexistent pollution standards, trading a clean environment for jobs. Some politicians worry that their country may become overly dependent on key imported products, like oil, which in a time of war could threaten national security. All of these fears influence governments to reach the same basic policy conclusion: to protect national interests, whether businesses, jobs, or security - imports of foreign products should be restricted. This chapter analyzes such arguments. First, however, it is essential to learn a few key concepts and understand how the demand and supply model applies to international trade.

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Protectionism: An Indirect Subsidy from Consumers to Producers

By the end of this section, you will be able to:

- Explain protectionism and its three main forms
- Analyze protectionism through concepts of demand and supply, noting its effects on equilibrium
- Calculate the effects of trade barriers

When a government legislates policies to reduce or block international trade it is engaging in **protectionism**. Protectionist policies often seek to shield domestic producers and domestic workers from foreign competition. Protectionism takes three main forms: tariffs, import quotas, and nontariff barriers.

Tariffs are taxes imposed on imported goods and services. They make imports more expensive for consumers, discouraging imports. For example, in 2016 the tariff on wheat imported to South Africa increased by 30% to an all time high of R1591.40 per tonne of wheat (Sihlobo: 2016). This works out to 40% of the price of a tonne of wheat!

Another way to control trade is through **import quotas**, which are numerical limitations on the quantity of products that can be imported. Take the case of China whose share of South Africa's total imports of clothing and textiles rocketed from 16.1 percent in 1996 to 60.7 percent in 2008. Estimates indicate that, from 2002 to 2008, 69 000 jobs were lost in South Africa's clothing and textiles sector, a drop of 39 percent (Biacuana: 2009). Labor unions consequently lobbied strongly for protection to limit further job losses. This resulted in the imposition of quotas on selected clothing and textiles imports from China between 2007 and 2008. The intention was that these quotas would give the South African textile industry enough time to restructure and improve competitiveness. The hope was also that this measure would stimulate private investment that would boost production and employment.

Non-tariff barriers are all the other ways that a nation can draw up rules, regulations, inspections, and paperwork to make it more costly or difficult to import products. A rule requiring certain safety standards, for instance, can

limit imports just as effectively as high tariffs or low import quotas. Take the example of African trade with the European Union (EU). In order for African products to be allowed into EU markets they must comply with the EU standard requirements, so-called Hurdles To Pass (HTP). Herbs and spices require 5 HTP's as do nuts and seeds (Radlicki: 2015). Fish and fishery produce are required to comply with 10 HTP's, with fruit and vegetable produce requiring as many as 11 HTP's. These HTP's include checks for: mycotoxins, microbiological contaminants, heavy metals, unauthorised food additives, product composition, pesticides residues, genetically modified organisms/novel food, foreign bodies, radiation, parasitic infestation and a suspiciously and conveniently broad category requirement labelled "other". In addition to HTP's, there are also SPS's – sanitary and phyto-sanitary measures (Radlicki: 2015) which are also non-tariff barriers aimed at further stifling imports.

Non-tariff barriers may also take the form of "rules-of-origin" regulations - these rules say that the "Made in Country X" label refers to the country in which the last substantial change in the product took place. A manufacturer wishing to evade import restrictions may therefore try to change the production process so that the last big change in the product happens in his or her own country. For example, certain textiles manufactured in South Africa, shipped to other countries (for example, Lesotho), combined with textiles made in those other countries to make apparel—and then re-exported back to South Africa for a final assembly, to escape paying tariffs or to obtain a "Made in RSA" label.

Realizing the compromises between nations that come about due to trade policy, many countries came together in 1947 to form the General Agreement on Tariffs and Trade (GATT). (We'll cover the GATT in more detail later in the chapter.) This agreement has since been superseded by the **World Trade Organization (WTO)**, whose membership includes about 150 nations and most of the economies of the world. It is the primary international mechanism through which nations negotiate their trade rules—including rules about tariffs, quotas, and nontariff barriers. The next section examines the results of such protectionism and develops a simple model to show the impact of trade policy.

Demand and Supply Analysis of Protectionism

To the non-economist, restricting imports may appear to be nothing more than taking sales from foreign producers and giving them to domestic producers. Other factors are at work, however, because firms do not operate in a vacuum. Instead, firms sell their products either to consumers or to other firms (if they are business suppliers), who are also affected by the trade barriers. A demand and supply analysis of protectionism shows that it is not just a matter of domestic gains and foreign losses, but a policy that imposes substantial domestic costs as well.

Consider two countries, Brazil and South Africa, who both produce sugar. Each country has a domestic supply and demand for sugar, as detailed in Table 1 and illustrated in Figure 1. In Brazil, without trade, the equilibrium price of sugar is R4900/ton and the equilibrium output is 30 tons. When there is no trade in South Africa, the equilibrium price of sugar is R8900/ton and the equilibrium quantity is 80 tons. These equilibrium points are labeled with the point E.

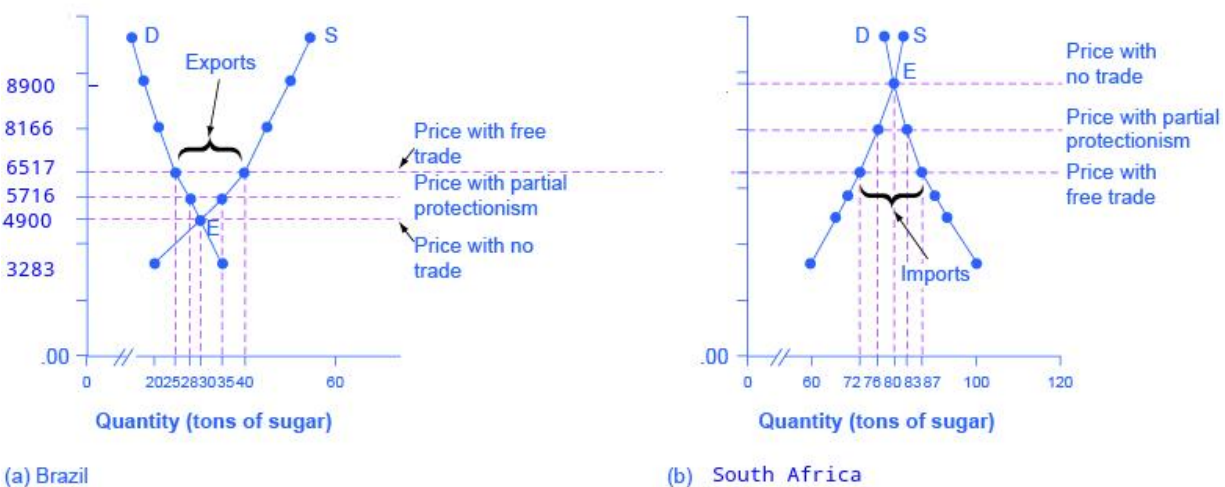


Figure 1: Before trade, the equilibrium price of sugar in Brazil is R4900 per ton and R8900 per ton in South Africa. When trade is allowed, businesses

will buy cheap sugar in Brazil and sell it in South Africa. This will result in higher prices in Brazil and lower prices in South Africa. Ignoring transaction costs, prices should converge to R6517 per ton, with Brazil exporting 15 tons of sugar and South Africa importing 15 tons of sugar. If trade is only partly open between the countries, it will lead to an outcome between the free-trade and no-trade possibilities.

Price (R/ton)	Brazil: Quantity Supplied (tons)	Brazil: Quantity Demanded (tons)	S.A.: Quantity Supplied (tons)	S.A: Quantity Demanded (tons)
3283	20	35	60	100
4900	30	30	66	93
5716	35	28	69	90
6517	40	25	72	87
8166	45	21	76	83
9800	50	18	80	80
11433	55	15	82	78

The Sugar Trade between Brazil and South Africa

If international trade between Brazil and South Africa now becomes possible, profit-seeking firms will spot an opportunity: buy sugar cheaply in

Brazil, and sell it at a higher price in South Africa. As sugar is shipped from Brazil to South Africa, the quantity of sugar produced in Brazil will be greater than Brazilian consumption (with the extra production being exported), and the amount produced in South Africa will be less than the amount of South African consumption (with the extra consumption being imported). Exports to South Africa will reduce the supply of sugar in Brazil, raising its price. Imports into South Africa will increase the supply of sugar, lowering its price. When the price of sugar is the same in both countries, there is no incentive to trade further. As Figure 1 shows, the equilibrium with trade occurs at a price of R6517 per ton. At that price, the sugar farmers of Brazil supply a quantity of 40 tons, while the consumers of Brazil buy only 25 tons.

The extra 15 tons of sugar production, shown by the horizontal gap between the demand curve and the supply curve in Brazil, is exported to South Africa. In South Africa, at a price R6517 per ton, the farmers produce a quantity of 72 tons and consumers demand a quantity of 87 tons. The excess demand of 15 tons by South African consumers, shown by the horizontal gap between demand and domestic supply at the price of R6517 per ton, is supplied by imported sugar. Free trade typically results in income distribution effects, but the key is to recognize the overall gains from trade, as shown in Figure 2. Figure 2 (a) shows that producers in Brazil gain by selling more sugar at a higher price, while Figure 2 (b) shows consumers in South Africa benefit from the lower price and greater availability of sugar. Consumers in Brazil are worse off (compare their no-trade consumer surplus with the free-trade consumer surplus) and South African producers of sugar are worse off. There are gains from trade—an increase in social surplus in each country. That is, both South Africa and Brazil are better off than they would be without trade. The following Clear It Up feature explains how trade policy can influence low-income countries.

Free Trade of Sugar

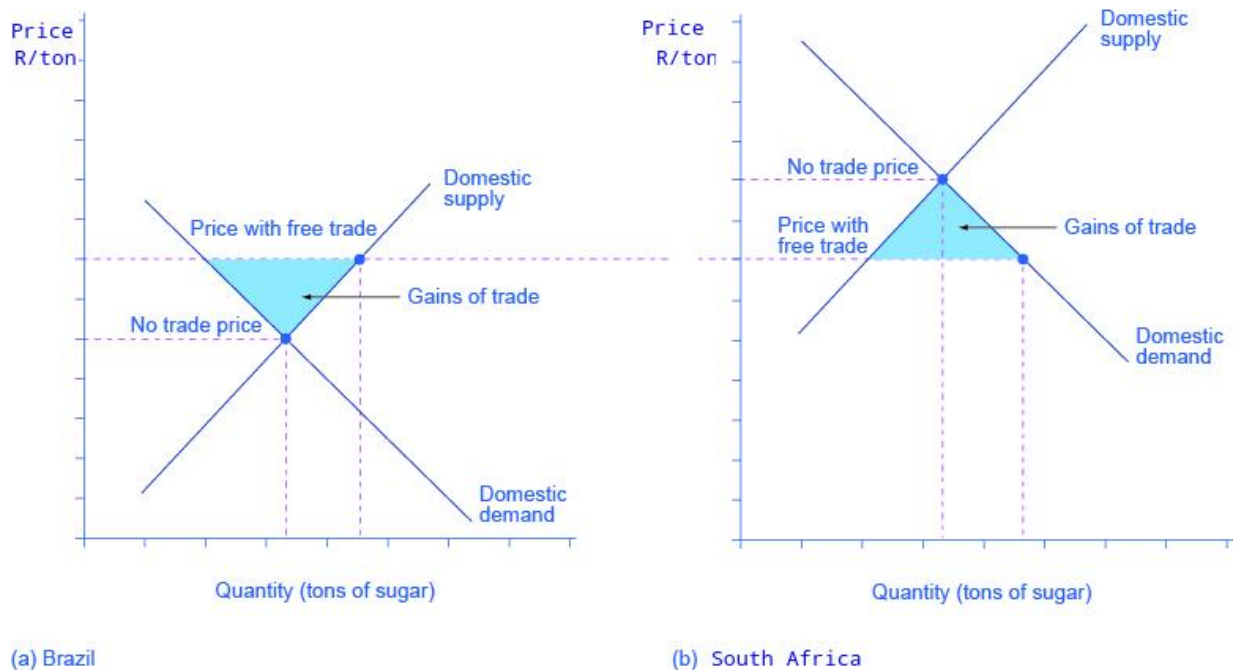


Figure 2: Free trade results in gains from trade. Total surplus increases in both countries. However, there are clear income distribution effects.

Note:

Visit this [website](#) to read more about the global sugar trade.



Note:

Why are there low-income countries?

South Africa is classified as an upper middle income country (World Bank: 2016). However many other African countries such as Mozambique and

Lesotho are categorized as low income countries (that is, poor). Why are the poor countries of the world poor? There are a number of reasons, but one of them will surprise you: the trade policies of the high-income countries.

High-income countries of the world—primarily the United States, Canada, countries of the European Union, and Japan—subsidize their domestic farmers collectively by about \$360 billion per year. By contrast, the total amount of foreign aid from these same high-income countries to the poor countries of the world is about \$70 billion per year, or less than 20% of the farm subsidies. Why does this matter?

It matters because the support of farmers in high-income countries is devastating to the livelihoods of farmers in low-income countries. Even when their climate and land are well-suited to products like cotton, rice, sugar, or milk, farmers in low-income countries find it difficult to compete. Farm subsidies in the high-income countries cause farmers in those countries to increase the amount they produce. This increase in supply drives down world prices of farm products below the costs of production.

As Michael Gerson of the *Washington Post* describes it (Gerson: 2007):

“[T]he effects in the cotton-growing regions of West Africa are dramatic . . . keep[ing] millions of Africans on the edge of malnutrition. In some of the poorest countries on Earth, cotton farmers are some of the poorest people, earning about a dollar a day. . . . Who benefits from the current system of subsidies? About 20,000 American cotton producers, with an average annual income of more than \$125,000.”

As if subsidies were not enough, often, the high-income countries block agricultural exports from low-income countries. In some cases, the situation gets even worse when the governments of high-income countries, having bought and paid for an excess supply of farm products, give away (dump) those products in poor countries and drive local farmers out of business altogether.

For example, shipments of excess milk from the European Union to Jamaica have caused great hardship for Jamaican dairy farmers. Shipments of excess rice from the United States to Haiti drove thousands of low-income rice farmers in Haiti out of business. The opportunity costs of protectionism are not paid just by domestic consumers, but also by foreign producers—and for many agricultural products, those foreign producers are the world’s poor.

Now, let's look at what happens with protectionism. South African sugar farmers are likely to argue that, if only they could be protected from sugar imported from Brazil, South Africa would have higher domestic sugar production, more jobs in the sugar industry, and South African sugar farmers would receive a higher price. If the South African government sets a high-enough tariff on imported sugar, or sets an import quota at zero, the result will be that the quantity of sugar traded between countries could be reduced to zero, and the prices in each country will return to the levels before trade was allowed.

Blocking only some trade is also possible. Suppose that South Africa passed a sugar import quota of seven tons. South Africa will import no more than seven tons of sugar, which means that Brazil can export no more than seven tons of sugar to South Africa. As a result, the price of sugar in South Africa will be R8166 per ton, which is the price where the quantity demanded is seven tons greater than the domestic quantity supplied. Conversely, if Brazil can export only seven tons of sugar, then the price of sugar in Brazil will be R5716 per ton, which is the price where the domestic quantity supplied in Brazil is seven tons greater than domestic demand.

In general, when a country sets a low or medium tariff or import quota, the equilibrium price and quantity will be somewhere between no trade and completely free trade. The following Work It Out explores the impact of these trade barriers.

Note:**Effects of Trade Barriers**

Let's look carefully at the effects of tariffs or quotas. If the South African government imposes a tariff or quota sufficient to eliminate trade with Brazil, two things occur: South African consumers pay a higher price and therefore buy a smaller quantity of sugar. South African producers obtain a higher price so they sell a larger quantity of sugar. The effects of a tariff on producers and consumers in South Africa can be measured using the concepts of consumer surplus and producer surplus.

South African Sugar Supply and Demand

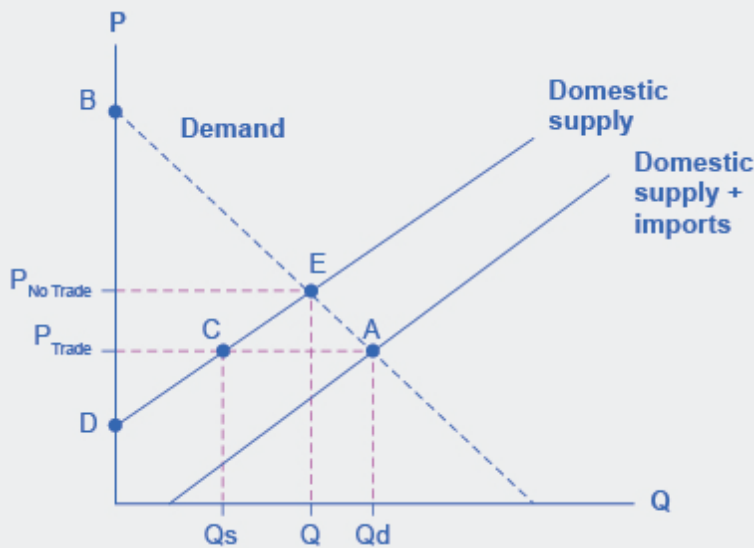


Figure 3: When there is free trade, the equilibrium is at point A. When there is no trade, the equilibrium is at point E.

Step 1. Look at Figure 3, which shows a hypothetical version of the demand and supply of sugar in South Africa.

Step 2. Note that the sugar market is in equilibrium at point A where Domestic Quantity Demanded (Q_d) = Quantity Supplied (Domestic Q_s + Imports from Brazil) at a price of P_{Trade} when there is free trade.

Step 3. Note, also, that imports are equal to the distance between points C and A.

Step 4. Consumer surplus is the value a consumer gets beyond what they paid for when they buy a product. Graphically, it is the area under a demand curve but above the price. In this case, the consumer surplus in South Africa is the area of the triangle formed by the points P_{Trade} , A, and B.

Step 5. Producer surplus is another name for profit—it is the income producers get above the cost of production, which is shown by the supply curve here. In this case, the producer surplus with trade is the area of the triangle formed by the points P_{trade} , C, and D.

Step 6. Suppose that the barriers to trade are imposed, imports are excluded, and the price rises to P_{NoTrade} . Look what happens to producer surplus and consumer surplus. At the higher price, the domestic quantity supplied increases from Q_s to Q at point E. Because producers are selling

more quantity at a higher price, the producer surplus increases to the area of the triangle P_{NoTrade} , E, and D.

Step 7. Compare the areas of the two triangles and you will see the increase in the producer surplus.

Step 8. Examine the consumer surplus. Consumers are now paying a higher price to get a lower quantity (Q instead of Q_d). Their consumer surplus shrinks to the area of the triangle P_{NoTrade} , E, and B.

Step 9. Determine the net effect. The producer surplus increases by the area P_{trade} , C, E, P_{NoTrade} . The loss of consumer surplus, however, is larger. It is the area P_{trade} , A, E, P_{NoTrade} . In other words, consumers lose more than producers gain as a result of the trade barriers and South Africa has a lower social surplus.

Who Benefits and Who Pays?

Using the demand and supply model, consider the impact of protectionism on producers and consumers in each of the two countries. For protected producers like South African sugar farmers, restricting imports is clearly positive. Without a need to face imported products, these producers are able to sell more, at a higher price. For consumers in the country with the protected good, in this case South African sugar consumers, restricting imports is clearly negative. They end up buying a lower quantity of the good and paying a higher price for what they do buy, compared to the equilibrium price and quantity without trade. The following Clear It Up feature considers why a country might outsource jobs even for a domestic product.

Note:

Why are Life Savers, an American product, not made in America?

Life Savers is an American brand of ring-shaped mints and artificially fruit-flavoured hard sweets which can be purchased at special outlets in South Africa. The sweets are known for their distinctive packaging, coming in aluminium foil rolls. Life Savers were invented in 1912 by Clarence Crane in Cleveland, Ohio. Starting in the late 1960s and for 35 years afterward, 46 billion Life Savers a year, in 200 million rolls, were produced by a plant in

Holland, Michigan. But in 2002, the Kraft Foods Group, Inc. (an American company) announced that the Michigan plant would be closed and Life Saver production moved across the border to Montreal, Canada.

One reason is that Canadian workers are paid slightly less, especially in healthcare and insurance costs that are not linked to employment there.

Another main reason is that the United States government keeps the price of sugar high for the benefit of sugar farmers, with a combination of a government price floor program and strict quotas on imported sugar.

According to the Coalition for Sugar Reform, from 2009 to 2012, the price of refined sugar in the United States ranged from 64% to 92% higher than the world price. Life Saver production uses over 100 tons of sugar each day, because the sweets are 95% sugar.

A number of other sweet companies have also reduced United States production and expanded foreign production. Indeed, from 1997 to 2011, some 127,000 jobs in the sugar-using industries, or more than seven times the total employment in sugar production, were eliminated. While the United States sweet industry is especially affected by the cost of sugar, the costs are spread more broadly. United States consumers pay roughly \$1 billion per year in higher food prices because of elevated sugar costs. Meanwhile, sugar producers in low-income countries are driven out of business. Because of the sugar subsidies to domestic producers and the quotas on imports, they cannot sell their output profitably, or at all, in the United States market.

The fact that protectionism pushes up prices for consumers in the country enacting such protectionism is not always acknowledged openly, but it is not disputed. After all, if protectionism did not benefit domestic producers, there would not be much point in enacting such policies in the first place. Protectionism is simply a method of requiring consumers to subsidize producers. The subsidy is indirect, since it is paid by consumers through higher prices, rather than a direct subsidy paid by the government with money collected from taxpayers. But protectionism works like a subsidy, nonetheless. The American satirist Ambrose Bierce defined “tariff” this way in his 1911 book, *The Devil’s Dictionary*: “Tariff, n. A scale of taxes on imports, designed to protect the domestic producer against the greed of his consumer.”

The effect of protectionism on producers and consumers in the foreign country is complex. When an import quota is used to impose partial protectionism, the sugar producers of Brazil receive a lower price for the sugar they sell in Brazil—but a higher price for the sugar they are allowed to export to South Africa. Indeed, notice that some of the burden of protectionism, paid by domestic consumers, ends up in the hands of foreign producers in this case. Brazilian sugar consumers seem to benefit from South African protectionism, because it reduces the price of sugar that they pay. On the other hand, at least some of these Brazilian sugar consumers also work as sugar farmers, so their incomes and jobs are reduced by protectionism. Moreover, if trade between the countries vanishes, Brazilian consumers would miss out on better prices for imported goods—which do not appear in our single-market example of sugar protectionism.

The effects of protectionism on foreign countries notwithstanding, protectionism requires domestic consumers of a product (consumers may include either households or other firms) to pay higher prices to benefit domestic producers of that product. In addition, when a country enacts protectionism, it loses the economic gains it would have been able to achieve through a combination of comparative advantage, specialized learning, and economies of scale, concepts discussed in the International Trade chapter.

Key Concepts and Summary

There are three tools for restricting the flow of trade: tariffs, import quotas, and nontariff barriers. When a country places limitations on imports from abroad, regardless of whether it uses tariffs, quotas, or nontariff barriers, it is said to be practicing protectionism. Protectionism will raise the price of the protected good in the domestic market, which causes domestic consumers to pay more, but domestic producers to earn more.

Self-Check Questions

Exercise:

Problem:

Explain how a tariff reduction causes an increase in the equilibrium quantity of imports and a decrease in the equilibrium price.

Solution:

A reduced tariff is like a decrease in the cost of production, which is shown by a downward (or rightward) shift in the supply curve.

Exercise:**Problem:**

Explain how a subsidy on agricultural goods like sugar adversely affects the income of foreign producers of imported sugar.

Solution:

A subsidy is like a reduction in cost. This shifts the supply curve down (or to the right), driving the price of sugar down. If the subsidy is large enough, the price of sugar can fall below the cost of production faced by foreign producers, which means they will lose money on any sugar they produce and sell.

Review Questions**Exercise:****Problem:**

Who does protectionism protect? What does it protect them from?

Exercise:**Problem:**

Name and define three policy tools for enacting protectionism.

Exercise:

Problem:

How does protectionism affect the price of the protected good in the domestic market?

Critical Thinking Questions**Exercise:****Problem:**

Show graphically that for any tariff, there is an equivalent quota that would give the same result. What would be the difference, then, between the two types of trade barriers? *Hint:* It is not something you can see from the graph.

Exercise:**Problem:**

From the "Effects of Trade Barriers" (Figure 3: South African Sugar Supply and Demand) above you can see that a tariff raises the price of imports. What is interesting is that the price rises by less than the amount of the tariff. Who pays the rest of the tariff amount? Can you show this graphically?

Problems**Exercise:****Problem:**

Assume two countries, Thailand (T) and Japan (J), have one good: cameras. The demand (d) and supply (s) for cameras in Thailand and Japan is described by the following functions:

Equation:

$$Q_d^T = 60 - P$$

Equation:

$$Q_s^T = -5 + \frac{1}{4}P$$

Equation:

$$Q_d^J = 80 - P$$

Equation:

$$Q_s^J = -10 + \frac{1}{2}P$$

P is the price measured in a common currency used in both countries, such as the Thai Baht.

- a. Compute the equilibrium price (P) and quantities (Q) in each country without trade.
- b. Now assume that free trade occurs. The free-trade price goes to 56.36 Baht. Who exports and imports cameras and in what quantities?

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Glossary

import quotas

numerical limits on the quantity of products that can be imported

nontariff barriers

ways a nation can draw up rules, regulations, inspections, and paperwork to make it more costly or difficult to import products

protectionism

government policies to reduce or block imports

World Trade Organization (WTO)

organization that seeks to negotiate reductions in barriers to trade and to adjudicate complaints about violations of international trade policy; successor to the General Agreement on Tariffs and Trade (GATT)

International Trade and Its Effects on Jobs, Wages, and Working Conditions

By the end of this section, you will be able to:

- Discuss how international trade influences the job market
- Analyze the opportunity cost of protectionism
- Explain how international trade impacts wages, labor standards, and working conditions

In theory at least, imports might injure workers in several different ways: fewer jobs, lower wages, or poor working conditions and this is likely to have political implications. The year 2016 was momentous in several respects but, most notably, for two particular developments. The first was Britain's exit from the European Union (so-called "Brexit") and the other was Donald Trump's election as the 45th president of the USA. Both outcomes were unexpected. Many did not expect Britain to give up the benefits of European membership. Even more did not expect a seemingly arrogant billionaire businessman with no experience of government, and apparently little respect for women, Muslims and minorities to be chosen to lead the biggest economy in the world. However, both Brexit and Donald Trump's election were at least partly due to voters in Britain (in the case of Brexit) and the U.S.A. (in the case of Trump) signalling their impatience at unemployment and low wages they felt were the result of international trade (Colantone and Stanig: 2016, Flegenheimer and Barbaro: 2016). Both Brexit and Trump were actually votes against free trade and migration.

From the theory of comparative advantage, one would expect international trade growth to generate new jobs, lift incomes/wages and stimulate economic development (improved working and living conditions). However, the evidence in this regard seems to be mixed.

Figure 1 represents the domestic labor market for general manufacturing workers of Country A. We_1 and Ql_1 represent average market equilibrium wage and employment levels respectively prior to trade liberalisation (free trade). Now assume that Country A enters into a bilateral (between two countries) trade agreement with Country B according to each country's comparative advantage. This arrangement should increase the **total production** of both countries according to the principle of comparative

advantage. Increased production in Country A (our focus) will increase the demand for labor (production cannot increase without more labor in most cases). So demand for labor shifts right from $D11$ to $D12$. This should result in an increase in market wage from $We1$ to $We2$ and employment increases from $Q11$ to $Q12$. And better wages should, *ceteris paribus*, contribute to better working conditions. The labor market for general manufacturing workers in Country B should be similarly affected. Well, that is the theory anyway! So if free trade between countries is meant to be so beneficial for everyone, why did Brexit and Donald Trump happen against all expectations?

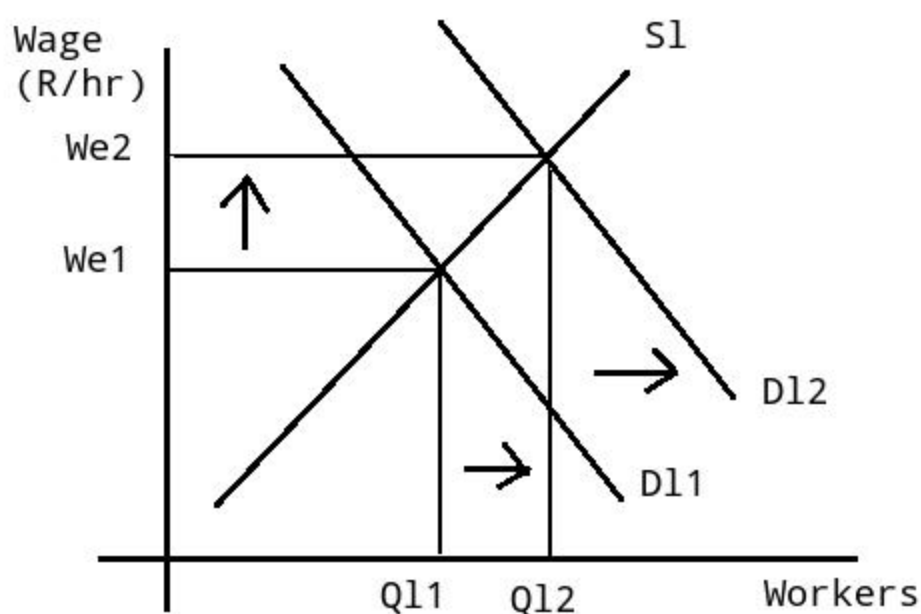


Figure 1. The labor market for general workers in Country A

In fact the effects of trade liberalization on labor markets can be quite complex due to various factors: economic policy, political considerations, local economic conditions, the structure of the domestic economy, skills

levels of workers and so forth. Each case would have to be considered on its merits to determine what effects free trade has had on labor market outcomes such as wages, employment levels and working conditions. It would be difficult, if not impossible, to determine general patterns that apply equally to all countries.

Hard Evidence of The Effects of Trade

Table 1 reviews some international evidence of the effects on developing countries such as South Africa of trade agreements between countries on employment, wages and working conditions. The evidence seems to be mixed. In some cases trade liberalisation has resulted in more employment and in others it has been blamed for higher levels of unemployment. In some instances trade liberalisation has been associated with higher wages and in others lower wages. It seems also that free trade has caused wage gaps between different categories of workers to widen.

Labour market outcome	Country (Period)	Effect of trade liberalisation (free trade)
Employment/unemployment	Chile, 1970s	Some evidence of increased unemployment (Ebert, 2015).
	Uruguay, 1979-1986	Increased unemployment in manufacturing sector (Ebert, 2015).
	Mexico, 1985-1987	Slight increase in unemployment
	Africa, including Middle East and North Africa, 2002	Decrease in unemployment for African countries, excluding non Middle East and North African countries (Ebert, 2015).
	South Africa, 1990s	Increase in employment across all educational levels (Bhorat and Lundall, 2004).
	South Africa, post 1994	Significant Increase in unemployment in the agricultural and manufacturing (clothing) sector (Theron et al., 2007)
	Colombia, 1980 and 1990s	No effect on employment levels(Ebert, 2015).
Wages	Brazil, 1990-1998	Wages of more highly educated workers affected more than workers with lower education levels (Ebert, 2015).
	South Africa, 1990s	Wages paid by foreign manufacturing firms in South Africa were roughly 8% higher than those paid by domestic firms (Bhorat and Lundall, 2004)
	South Africa, post 1994	Decrease in wages in the manufacturing (clothing) sector (Theron et al., 2007).
	Indonesia, 1991-2000	Increase in wages of importing/exporting firms but decrease in wages of firms not engaged in international trade (Ebert, 2015).
	Uruguay, 2011	Wages increased and the gap between white-collar (professional) and blue-collar (artisans) workers decreased (Ebert, 2015).
	Mexico, 1980s and 1990s	The wage gap between high skilled and low skilled workers increased (Ebert, 2015).
	Colombia, 1980 and 1990s	Increased wage dispersion (the range of wage rates increased) (Ebert, 2015).
Labor unions' strength	Belgium, 2010	Bargaining power of employees falls with imports and domestic low skilled jobs are off-shored (taken over by workers in the trading partner country). Trade unions' bargaining power is reduced (Ebert, 2015).
	South Africa, post 1994	Decrease in bargaining power of trade unions in the manufacturing (clothing) sector to influence wages (Theron et al., 2007).
	15 developed countries after the 1980s	Bargaining power and militancy of trade unions reduced (Ebert, 2015).
	Brazil, 1990s	Bargaining power of trade unions increased to achieve greater influence over wage determination/structure (Ebert, 2015).
Labor market informality	Brazil and Colombia, 1980s and 1990s	Some evidence of an increase in informality (Ebert, 2015).
	South Africa, post 1994	Evidence of growing informality in the manufacturing (clothing) sector as foreign competition drives domestic firms out of the formal domestic labor market which regulates basic conditions of employment (Theron et al., 2007).
	Mexico, 2006	Evidence of an increase in informality in export industries (Ebert, 2015).
	Argentina, 1980-2001	Some evidence of an increase in informality (Ebert, 2015).
	Sri Lanka, 1996-2007	Higher informality in industries exposed to international competition/imports (Ebert, 2015).

Table 1. The effects of trade liberalization on labor market outcomes for selected countries. Based on studies by Ebert (2015), Bhorat and

Lundall (2004), Theron et al (2007) published by the International Labour Organization.

The working conditions of employees can be gauged by the strength of labor unions and the degree of informality in the labor market. The stronger the labor union, the better it can protect the interests of members/workers. It seems that trade liberalisation has generally had the effect of reducing domestic union power due to cheaper imports. Unions have thus sometimes been unable to secure required wage increases to maintain reasonable living standards for members. Similarly, increased foreign competition has in some cases driven domestic firms out of the formal labor market in which basic conditions of employment are regulated. Thus firms, under pressure from foreign competition/imports, turn to cheaper labor in the informal labor markets where basic conditions of employment cannot be easily monitored, minimum wage legislation is not observed, safety regulations may be ignored etc. The net result seems to be that trade liberalisation has, in some cases, resulted in a deterioration of working conditions.

In the next section we discuss some of the trends/patterns reported for developing countries in general regarding the effects of globalisation and free trade on domestic employment, wages and working conditions. In some cases special mention will be made of South Africa's experiences.

Fewer Jobs?

Bhorat and Lundall (2004) report a steady rise in the share of highly skilled workers in total employment through the 1990's when globalisation and free trade were accepted as the norm. They note however that employment in the primary sector contracted while employment in the services sector increased. Thus labor demand shifted out of agriculture into services in many parts of the developing world.

According to Bhorat and Lundall (2004) then, a fundamental shift in employment patterns has occurred across the developing world since 1980, a time period during which globalisation and free trade came into full swing. They observe that the declining share of agriculture in developing country GDP, and the increased share of services (and in some cases

industry as well) – resulted in widespread reallocation of employment. Bhorat and Lundall suggest that the changing contributions of different sectors to GDP not only induced structural change in developing country economies, but also resulted in notable between-sector employment shifts as employment shifted out of contracting sectors and into expanding ones. They note, furthermore, that employment of highly skilled workers increased at a faster rate than employment of less skilled employees during the 1990s (as globalisation and free trade gathered pace).

Theron et al. (2007) confirm that the structure of employment both within sectors and between sectors has changed since the 1990s, in the period since trade liberalization took effect. They agree that the most notable change between sectors is a decline in employment in the primary sector, with most new jobs being created in the tertiary sector. Theron et al. (2007) argue that, whatever the impact of trade liberalization may have been, it has not reversed, or contributed to reversing, the general pattern of job losses in the formal economy. They concur with the findings of other studies that the clearest trend to emerge (as a result of trade liberalization) is the continuing decline in the relative proportion of lesser skilled to more skilled workers.

In questioning whether trade liberalization, on balance, has had a beneficial impact on South African employment levels, Theron et al. (2007) point to the steady increase in exports (and presumably increased employment), which they concede may be ascribed to trade liberalization. However, they also note that there has also been an increase in imports (which would threaten local jobs) over the same period so that by the beginning of 2004 the rate of increase in imports had exceeded the rate of increase in exports, resulting in a growing current account deficit. As reflected in Table 1, Theron et al. (2007) report significant increases in unemployment in the agricultural and manufacturing (clothing) sectors of South Africa as a likely consequence of trade liberalization. Contrary to this finding, Bhorat and Lundall (2004) report increased employment across all educational levels during the 1990s. This seemingly contradictory finding may be due to the likelihood that employment in other sectors such as tertiary/services may be growing even as employment in sectors such as agriculture and manufacturing slows down.

Trade and Wages

Even if trade/imports does not reduce the number of jobs, it could affect wages. Here, it is important to separate issues about the average level of wages from issues about whether the wages of certain workers may be helped or hurt by trade.

Because free trade should result in higher production levels if firms and workers play to their comparative advantage, it should also cause the average level of wages in an economy to rise. Recall that the demand for labor is a "derived" demand. Thus workers who can produce more will be more desirable to employers, which will shift the demand for their labor out to the right, and increase wages in the labor market. By contrast, barriers to trade will reduce the average level of wages in an economy.

However, even if trade increases the overall wage level, it will still benefit some workers and hurt others. Workers in industries that are confronted by competition from imported products may find that demand for their labor decreases and shifts back to the left, so that their wages decline with a rise in international trade. Conversely, workers in industries that benefit from selling in global markets may find that demand for their labor shifts out to the right, so that trade raises their wages.

Note:

View this [website](#) to read an article on the issues surrounding fair trade coffee.



One concern is that while globalization may be benefiting high-skilled, high-wage workers in South Africa, it may also impose costs on low-skilled, low-wage domestic workers in the country. After all, high-skilled South African workers presumably benefit from increased sales of sophisticated, high value products like motor vehicles, transport equipment, and chemicals in which South Africa has a comparative advantage. Meanwhile, low-skilled South African workers must now compete against extremely low-wage workers worldwide for making simpler, low value products like textiles/clothing and agricultural produce. As a result, the wages of low-skilled South African workers are likely to fall. It is in this context that we can appreciate Theron et al's (2007) finding that wages in South Africa's clothing sector post 1994 (see Table 1) declined. On the other hand Bhorat and Lundall (2004) report that wages paid by foreign exporting firms in South Africa were higher than wages paid by non-exporting domestic firms. This finding accords with that reported by Ebert (2015) that wages paid by importing/exporting firms increased but wages paid by firms not engaged in international trade decreased (see Table 1). The benefits and costs of increased trade in terms of its effect on wages are thus not distributed evenly across the economy.

Labor Standards and Working Conditions

Workers in many low-income countries around the world labor under conditions that would be illegal for a worker in South Africa's formal, highly regulated labor market. Workers in countries like China, India and Thailand are often paid less than the industry or sector minimum wage in South Africa. For example, in South Africa in 2016, the minimum wage of a general worker was between R10.00 per hour - R13.00 per hour (Minimum wages in South Africa: 2016); a typical wage in many low-income countries might be more like R3.00-R4.00 per hour, or even less. Moreover, working conditions in low-income countries may be extremely unpleasant, or even unsafe. In the worst cases, production may involve the labor of small children or even workers who are treated nearly like slaves (Chamberlain: 2012).

The general pattern that can be observed from Table 1 seems to be that free trade/trade liberalisation has apparently weakened the position of labor

unions in developing countries such as South Africa and has also driven domestic firms to seek cheaper labor in the informal, unregulated labor market. So, under pressure from import competition and consequently falling sales and revenue, local firms try to cut costs by operating informally (not registering their business operations) so that they do not have to comply with licensing and labor regulations which can be costly. Consequently these businesses cannot easily be forced to pay the stipulated minimum wages nor can they easily be made to comply with other labor and safety regulations in their workplaces. The result is a deterioration in working and living conditions.

In thinking about labor standards in other countries, it is important to draw some distinctions between what is truly unacceptable and what is painful to think about. Most people, economists included, have little difficulty with the idea that production by six-year-olds confined in factories or by slave labor is morally unacceptable. They would support aggressive efforts to eliminate such practices—including shutting out imported products made with such labor. Many cases, however, are less clear-cut. An opinion article in the *New York Times* several years ago (Kristof: 2002) described the case of Ahmed Zia, a 14-year-old boy from Pakistan. He earned \$2 per day working in a carpet factory. He dropped out of school in second grade. Should South Africa and other countries refuse to purchase rugs made by Ahmed and his co-workers? If the carpet factories were to close, the likely alternative job for Ahmed is farm work, and as Ahmed says of his carpet-weaving job: “This makes much more money and is more comfortable.”

Other workers may have even less attractive alternative jobs, perhaps scavenging garbage or prostitution. The real problem for Ahmed and many others in low-income countries is not that globalization has made their lives worse, but rather that they have so few good life alternatives.

Key Concepts and Summary

As international trade increases, it contributes to a shift in jobs away from industries where that economy does not have a comparative advantage and toward industries where it does have a comparative advantage. The degree to which trade affects labor markets has a lot to do with the structure of the

labor market in that country and the adjustment process in other industries. Global trade should raise the average level of wages by increasing productivity. However, this increase in average wages may include both gains to workers in certain jobs and industries and losses to others.

In thinking about labor practices in low-income countries, it is useful to draw a line between what is unpleasant to think about and what is morally objectionable. For example, low wages and long working hours in poor countries are unpleasant to think about, but for people in low-income parts of the world, it may well be the best option open to them. Practices like child labor and forced labor are morally objectionable and many countries refuse to import products made using these practices.

Self-Check Questions

Exercise:

Problem:

Explain how trade barriers save jobs in protected industries, but only by costing jobs in other industries.

Solution:

Trade barriers raise the price of goods in protected industries. If those products are inputs in other industries, it raises their production costs and then prices, so sales fall in those other industries. Lower sales lead to lower employment. Additionally, if the protected industries are consumer goods, their customers pay higher prices, which reduce demand for other consumer products and thus employment in those industries.

Exercise:

Problem:

Explain how trade barriers raise wages in protected industries by reducing average wages economy-wide.

Solution:

Trade based on comparative advantage raises the average wage rate economy-wide, though it can reduce the incomes of import-substituting industries. By moving away from a country's comparative advantage, trade barriers do the opposite: they give workers in protected industries an advantage, while reducing the average wage economy-wide.

Exercise:**Problem:**

How, in theory, could international trade affect working conditions of low-income countries?

Solution:

By raising incomes, trade tends to raise working conditions also, even though those conditions may not (yet) be equivalent to those in high-income countries.

Exercise:**Problem:**

Do the jobs for workers in low-income countries that involve making products for export to high-income countries typically pay these workers more or less than their next-best alternative?

Solution:

They typically pay more than the next-best alternative. If a Nike firm did not pay workers at least as much as they would earn, for example, in a subsistence rural lifestyle, they many never come to work for Nike.

Exercise:

Problem:

How do trade barriers affect the average income level in an economy?

Solution:

Since trade barriers raise prices, real incomes fall. The average worker would also earn less.

Exercise:**Problem:**

How does the cost of “saving” jobs in protected industries compare to the workers’ wages and salaries?

Solution:

Workers working in other sectors and the protected sector see a decrease in their real wage.

Review Questions**Exercise:****Problem:**

Does international trade, taken as a whole, increase the total number of jobs, decrease the total number of jobs, or leave the total number of jobs about the same?

Exercise:**Problem:**

Is international trade likely to have roughly the same effect on the number of jobs in each individual industry?

Exercise:

Problem:

How is international trade, taken as a whole, likely to affect the average level of wages?

Exercise:**Problem:**

Is international trade likely to have about the same effect on everyone's wages?

Critical Thinking Questions**Exercise:****Problem:**

If trade barriers hurt the average worker in an economy (due to lower wages), why does government create trade barriers?

Exercise:**Problem:**

Why do you think labor standards and working conditions are lower in the low-income countries of the world than in middle-income countries (such as South Africa) and high-income countries like the United States?

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Arguments in Support of Restricting Imports

By the end of this section, you will be able to:

- Explain and analyze various arguments that are in support of restricting imports, including the infant industry argument, the anti-dumping argument, the environmental protection argument, the unsafe consumer products argument, and the national interest argument
- Explain dumping and race to the bottom
- Evaluate the significance of countries' perceptions on the benefits of growing trade



Figure 1

As previously noted, protectionism requires domestic consumers of a product to pay higher prices to benefit domestic producers of that product. Countries that institute protectionist policies lose the economic gains

achieved through a combination of comparative advantage, specialized learning, and economies of scale. With these overall costs in mind, let us now consider, one by one, a number of arguments that support restricting imports.

The Infant Industry Argument

Imagine South Africa wants to start its own computer industry, but it has no computer firms that can produce at a low enough price and high enough quality to compete in world markets. However, South African politicians, business leaders, and workers hope that if the local industry had a chance to get established, before it needed to face international competition, then a domestic company or group of companies could develop the skills, management, technology, and economies of scale that it needs to become a successful profit-earning domestic industry. Thus, the infant industry argument for protectionism is to block imports for a limited time, to give the infant industry time to mature, before it starts competing on equal terms in the global economy.

The infant industry argument is theoretically possible, even sensible: give an industry a short-term indirect subsidy through protection, and then reap the long-term economic benefits of having a vibrant, healthy industry. Implementation, however, is tricky. In many countries, infant industries have gone from babyhood to senility and obsolescence without ever having reached the profitable maturity stage. Meanwhile, the protectionism that was supposed to be short-term often took a very long time to be repealed.

As one example, Brazil treated its computer industry as an infant industry from the late 1970s until about 1990. In an attempt to establish its computer industry in the global economy, Brazil largely barred imports of computer products for several decades. This policy guaranteed increased sales for Brazilian computers. However, by the mid-1980s, due to lack of international competition, Brazil had a backward and out-of-date industry, typically lagging behind world standards for price and performance by three to five years—a long time in this fast-moving industry. After more than a decade, during which Brazilian consumers and industries that would have benefited from up-to-date computers paid the costs and Brazil's computer

industry never competed effectively on world markets, Brazil phased out its infant industry policy for the computer industry.

Protectionism for infant industries always imposes costs on domestic users of the product, and typically has provided little benefit in the form of stronger, competitive industries. However, several countries in East Asia offer an exception. Japan, Korea, Thailand, and other countries in this region have sometimes provided a package of indirect and direct subsidies targeted at certain industries, including protection from foreign competition and government loans at interest rates below the market equilibrium. In Japan and Korea, for example, subsidies helped get their domestic steel and auto industries up and running.

Why did the infant industry policy of protectionism and other subsidies work fairly well in East Asia? Guidelines that have been used to guide countries thinking about infant industry protection include:

1. Do not hand out protectionism and other subsidies to all industries, but focus on a few industries where your country has a realistic chance to be a world-class producer.
2. Be very hesitant about using protectionism in areas like computers, where many other industries rely on having the best products available, because it is not useful to help one industry by imposing high costs on many other industries.
3. Have clear guidelines for when the infant industry policy will end.

In Korea in the 1970s and 1980s, a common practice was to link protectionism and subsidies to export sales in global markets. If export sales rose, then the infant industry had succeeded and the protectionism could be phased out. If export sales did not rise, then the infant industry policy had failed and the protectionism could be phased out. Either way, the protectionism would be temporary.

Following these rules is easier said than done. Politics often intrudes, both in choosing which industries will receive the benefits of being treated as “infants” and when to phase out import restrictions and other subsidies. Also, if the government of a country wishes to impose costs on its citizens so that it can provide subsidies to a few key industries, it has many tools for

doing so: direct government payments, loans, targeted tax reductions, government support of research and development of new technologies, and so on. In other words, protectionism is not the only or even the best way to support key industries.

Note:

Visit this [website](#) to view a presentation by Pankaj Ghemawat questioning how integrated the world really is.



The Anti-Dumping Argument

Dumping refers to selling goods below their cost of production. **Anti-dumping laws** block imports that are sold below the cost of production by imposing tariffs that increase the price of these imports to reflect their cost of production. Since dumping is not allowed under the rules of the World Trade Organization (WTO), nations that believe they are on the receiving end of dumped goods can file a complaint with the WTO. Anti-dumping complaints have risen in recent years, from about 100 cases per year in the late 1980s to about 200 new cases each year by the late 2000s. Note that dumping cases are countercyclical. During recessions, case filings increase. During economic booms, case filings go down. Individual countries have also frequently started their own anti-dumping investigations.

Brink (2012) notes that South Africa has been one of the most active users of anti-dumping legislation since as early as the 1920s. He observes that except for the period from the 1970s to 1992, the country regularly imposed

a large number of anti-dumping measures. Brink estimates that 938 anti-dumping investigations were carried out by South Africa between 1921 and 1994. He notes furthermore that anti-dumping duties were imposed in 128 of the 212 cases reported between 2005 and the establishment of the World Trade Organisation in 1995.

Why Might Dumping Occur?

Why would foreign firms export a product at less than its cost of production—which presumably means taking a loss? This question has two possible answers, one innocent and one more sinister.

The innocent explanation is that market prices are set by demand and supply, not by the cost of production. Perhaps demand for a product shifts back to the left or supply shifts out to the right, which drives the market price to low levels—even below the cost of production. When a local store has a going-out-of-business sale, for example, it may sell goods at below the cost of production. If international companies find that there is excess supply of steel or computer chips or machine tools that is driving the market price down below their cost of production—this may be the market in action.

The sinister explanation is that dumping is part of a long-term strategy. Foreign firms sell goods at prices below the cost of production for a short period of time, and when they have driven out the domestic South African competition, they then raise prices. This scenario is sometimes called predatory pricing.

Should Anti-Dumping Cases Be Limited?

Anti-dumping cases pose two questions. How much sense do they make in economic theory? How much sense do they make as practical policy?

In terms of economic theory, the case for anti-dumping laws is weak. In a market governed by demand and supply, the government does not guarantee that firms will be able to make a profit. After all, low prices are difficult for producers, but benefit consumers. Moreover, although there are plenty of cases in which foreign producers have driven out domestic firms, there are

zero documented cases in which the foreign producers then jacked up prices. Instead, foreign producers typically continue competing hard against each other and providing low prices to consumers. In short, it is difficult to find evidence of predatory pricing by foreign firms exporting to South Africa.

Even if one could make a case that the government should sometimes enact anti-dumping rules in the short term, and then allow free trade to resume shortly thereafter, there is a growing concern that anti-dumping investigations often involve more politics than careful analysis.

For example, if a company built a new factory two years ago, should part of the factory's cost be counted in this year's cost of production? When a company is in a country where prices are controlled by the government, like China for example, how can one measure the true cost of production? When a domestic industry complains loudly enough, government regulators seem very likely to find that unfair dumping has occurred. Indeed, a common pattern has arisen where a domestic industry files an anti-dumping complaint, the governments meet and negotiate a reduction in imports, and then the domestic producers drop the anti-dumping suit. In such cases, anti-dumping cases often appear to be little more than a cover story for imposing tariffs or import quotas.

In the 1980s, almost all of the anti-dumping cases were initiated by the United States, Canada, the European Union, Australia, and New Zealand. By the 2000s, countries like Argentina, Brazil, South Korea, South Africa, Mexico, and India were filing the majority of the anti-dumping cases before the World Trade Organization. As the number of anti-dumping cases has increased, and as countries such as the United States and the European Union feel targeted by the anti-dumping actions of others, the WTO may well propose some additional guidelines to limit the reach of anti-dumping laws.

In South Africa anti-dumping and other duties are levied on goods considered to be "dumped" in South Africa and on subsidized imported goods (South African Revenue Service: 2016). Goods targeted for anti-dumping duties are the subject of investigations into pricing and export incentives in the country of origin (exporting country). The rate at which

the duty is imposed will depend on the outcome of the investigations. Anti-dumping duties are either levied on an ad valorem basis (as a percentage of the value of the goods) or as a specific duty (as cents per unit). The amount and type of duty imposed on a good is determined by the following primary criteria: the customs value of the goods, the quantity of the goods and the tariff classification of the goods.

The Environmental Protection Argument

The potential for global trade to affect the environment has become controversial. A president of the Sierra Club, an environmental lobbying organization, once wrote: “The consequences of globalization for the environment are not good. ... Globalization, if we are lucky, will raise average incomes enough to pay for cleaning up some of the mess that we have made. But before we get there, globalization could also destroy enough of the planet’s basic biological and physical systems that prospects for life itself will be radically compromised.” (Ehrenfeld: 2003)

If free trade meant the destruction of life itself, then even economists would convert to protectionism! While globalization—and economic activity of all kinds—can pose environmental dangers, it seems quite possible that, with the appropriate safeguards in place, the environmental impacts of trade can be minimized. In some cases, trade may even bring environmental benefits.

In general, high-income countries such as the United States, Canada, Japan, and the nations of the European Union have relatively strict environmental standards. In contrast, middle- and low-income countries like South Africa, Brazil, Nigeria, India, and China have lower environmental standards. The general view of the governments of such countries is that environmental protection is a luxury: as soon as their people have enough to eat, decent healthcare, and longer life expectancies, then they will spend more money on sewage treatment plants, scrubbers to reduce air pollution from factory smokestacks, national parks to protect wildlife, and so on.

This gap in environmental standards between high-income and low-income countries raises two worrisome possibilities in a world of increasing global

trade: the “race to the bottom” scenario and the question of how quickly environmental standards will improve in low-income countries.

The Race to the Bottom Scenario

The **race to the bottom** scenario of global environmental degradation runs like this. Profit-seeking multinational companies shift their production from countries with strong environmental standards to countries with weak standards, thus reducing their costs and increasing their profits. Faced with such behavior, countries reduce their environmental standards to attract multinational firms, which, after all, provide jobs and economic clout. As a result, global production becomes concentrated in countries where it can pollute the most and environmental laws everywhere “race to the bottom.”

Although the race-to-the-bottom scenario sounds plausible, it does not appear to describe reality. In fact, the financial incentive for firms to shift production to poor countries to take advantage of their weaker environmental rules does not seem especially powerful. When firms decide where to locate a new factory, they look at many different factors: the costs of labor and financial capital; whether the location is close to reliable suppliers of the inputs that they need; whether the location is close to customers; the quality of transportation, communications, and electrical power networks; the level of taxes; and the competence, honesty and political stability of the local government. The cost of environmental regulations is a factor, too, but typically environmental costs are no more than 1 to 2% of the costs faced by a large industrial plant. The other factors that determine location are much more important to these companies than trying to skimp on environmental protection costs.

When an international company does choose to build a plant in a low-income country with lax environmental laws, it typically builds a plant similar to those that it operates in high-income countries with stricter environmental standards. Part of the reason for this decision is that designing an industrial plant is a complex and costly task, and so if a plant works well in a high-income country, companies prefer to use the same design everywhere. Also, companies realize that if they create an environmental disaster in a low-income country, it is likely to cost them a substantial amount of money in paying for damages, lost trust, and reduced

sales—by building up-to-date plants everywhere they minimize such risks. As a result of these factors, foreign-owned plants in low-income countries often have a better record of compliance with environmental laws than do locally-owned plants.

Pressuring Low-Income Countries for Higher Environmental Standards

In some cases, the issue is not so much whether globalization will pressure low-income countries to reduce their environmental standards, but instead whether the threat of blocking international trade can pressure these countries into adopting stronger standards. For example, restrictions on ivory imports in high-income countries, along with stronger government efforts to catch elephant poachers, have been credited with helping to reduce the illegal poaching of elephants in certain African countries.

However, it would be highly undemocratic for the well-fed citizens of high-income countries to attempt to dictate to the ill-fed citizens of low-income countries what domestic policies and priorities they must adopt, or how they should balance environmental goals against other priorities for their citizens. Furthermore, if high-income countries want stronger environmental standards in low-income countries, they have many options other than the threat of protectionism. For example, high-income countries could pay for anti-pollution equipment in low-income countries, or could help to pay for national parks. High-income countries could help pay for and carry out the scientific and economic studies that would help environmentalists in low-income countries to make a more persuasive case for the economic benefits of protecting the environment.

After all, environmental protection is vital to two industries of key importance in many low-income countries—agriculture and tourism. Environmental advocates can set up standards for labeling products, like “this tuna caught in a net that kept dolphins safe” or “this product made only with wood not taken from rainforests,” so that consumer pressure can reinforce environmentalist values. These values are also reinforced by the United Nations, which sponsors treaties to address issues such as climate change and global warming, the preservation of biodiversity, the spread of deserts, and the environmental health of the seabed. Countries that share a

national border or are within a region often sign environmental agreements about air and water rights, too. The World Trade Organization is also becoming more aware of environmental issues and more careful about ensuring that increases in trade do not inflict environmental damage.

The Unsafe Consumer Products Argument

One argument for shutting out certain imported products is that they are unsafe for consumers. Indeed, consumer rights groups have sometimes warned that the World Trade Organization would require nations to reduce their health and safety standards for imported products. However, the WTO explains its current agreement on the subject in this way: “It allows countries to set their own standards.” But it also says “regulations must be based on science. . . . And they should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail.” Thus, for example, under WTO rules it is perfectly legitimate for South Africa to pass laws requiring that *all* food products or cars sold in the South Africa meet certain safety standards approved by the South African government, whether or not other countries choose to pass similar standards. However, such standards must have some scientific basis. It is improper to impose one set of health and safety standards for domestically produced goods but a different set of standards for imports, or one set of standards for imports from Europe and a different set of standards for imports from Latin America.

In 2007, Mattel (a United States toy company) recalled nearly two million toys imported from China due to concerns about high levels of lead in the paint, as well as some loose parts. It is unclear if other toys were subject to similar standards. More recently, in 2013, Japan blocked imports of United States wheat because of concerns that genetically modified (GMO) wheat might be included in the shipments. The science on the impact of genetically modified organisms (GMOs) on health is still developing. In 2016, the electronics firm Samsung, recalled its flagship Samsung 7 smartphone in South Africa and globally over safety concerns (Samsung SA Supports Global Recall of Galaxy Note7 Smartphones: 2016).

The National Interest Argument

Some argue that a nation should not depend too heavily on other countries for supplies of certain key products, such as materials or technologies that might have national security applications, or fuel, like oil. Sasol (The South African Coal, Oil and Gas Corporation) was founded with the strategic intent of the South African government to reduce the country's reliance on imports of foreign oil.

Sasol was founded in 1950 as part of the process of industrialization that the South African government considered vital for its economic development and autonomy. The consideration that South Africa had no domestic oil reserves rendered the country vulnerable to disruption of supplies coming from outside the country. Even though it was generally much more expensive to produce oil from coal than from natural petroleum, the political as well as economic importance of reducing South Africa's dependence on other countries for a strategic resource as much as possible was sufficient to overcome any objections. Early attempts to attract private capital to fund the development of Sasol were unsuccessful and it was only with state support (and of course tax revenue) that the project could start (Sasol Limited history: 2002)

The "national interest" argument for trade protectionism is, however, not convincing. Several times in the last few decades, when disruptions in the Middle East have shifted the supply curve of oil back to the left and sharply raised the price, the effects have been felt across the South African economy. This is not, however, a very strong argument for restricting imports of oil while supporting firms like Sasol to produce expensive fuel with taxpayers' funds. If South Africa needs to be protected from a possible cut-off of foreign oil, then a more reasonable strategy would be to import 100% of the petroleum supply now, and save South African domestic oil resources for when or if the foreign supply is cut off.

It might also be useful to import extra oil and put it into a stockpile for use in an emergency, as the South African government in fact did by establishing a Strategic Fuel Fund in 1964 (Central Energy Fund: no date). Moreover, it may be necessary to discourage people from using oil, and to

start a high-powered program to seek out alternatives to oil such as renewable energy. A straightforward way to do this would be to raise taxes on oil. What's more, it makes no sense to argue that because oil is highly important to the South African economy, that South Africa should shut out oil imports and use up its domestic supplies of oil more quickly.

Whether or not to limit certain kinds of imports of key technologies or materials that might be important to national security and weapons systems is a slightly different issue. If weapons' builders are not confident that they can continue to obtain a key product in wartime, they might decide to avoid designing weapons that use this key product, or they can go ahead and design the weapons and stockpile enough of the key high-tech components or materials to last through an armed conflict. Think every country is pro-trade? How about South Africa relative to other countries? The following Clear it Up might surprise you.

Note:

How does South Africa really feel about expanding trade?

How do people around the world feel about expanding trade between nations? In summer 2007, the Pew Foundation surveyed 45,000 people in 47 countries (Kohut, Wike and Horowitz: 2007). One of the questions asked about opinions on growing trade ties between countries. Table 1 shows the percentages who answered either "very good" or "somewhat good" for some of countries surveyed.

For those who think of the United States as the world's leading supporter of expanding trade, the survey results may be perplexing. When adding up the shares of those who say that growing trade ties between countries is "very good" or "somewhat good," Americans had the least favorable attitude toward increasing globalization, while South Africans and the Chinese ranked highest. In fact, among the 47 countries surveyed, the United States ranked by far the lowest on this measure, followed by Egypt, Italy, and Argentina.

Country	Very Good	Somewhat Good	Total
China	38%	53%	91%
South Africa	42%	43%	87%
South Korea	24%	62%	86%
Germany	30%	55%	85%
Canada	29%	53%	82%
United Kingdom	28%	50%	78%
Mexico	22%	55%	77%
Brazil	13%	59%	72%
Japan	17%	55%	72%
United States	14%	45%	59%

The Status of Growing Trade Ties between Countries(Source: Kohut, Wike and Horowitz: 2007)

One final reason why economists often treat the **national interest argument** sceptically is that almost any product can be touted by lobbyists and politicians as vital to national security. Take, for example, an American case although the lesson can be applied anywhere, including in South Africa. In 1954, the United States became worried that it was importing half of the wool required for military uniforms, so it declared wool and mohair to be “strategic materials” and began to give subsidies to wool and mohair farmers. Although wool was removed from the official list of “strategic” materials in 1960, the subsidies for mohair continued for almost 40 years

until they were repealed in 1993, and then were reinstated in 2002. All too often, the national interest argument has become an excuse for handing out the indirect subsidy of protectionism to certain industries or companies.

After all, decisions about what constitutes a key strategic material are made by politicians, not nonpartisan analysts.

South Africa's very own example of Sasol also raises eyebrows as to how believable the national/strategic interest argument for trade protection is. Davie (2005) notes, at a time when international oil prices were low, that the South African government subsidised Sasol to the tune of R6 billion to cover its losses incurred as a result of low oil prices. This debt was never repaid and so amounts to a squandering of tax revenue.

A strong possibility of corruption arises when politicians and bureaucrats are tempted to meddle in trade arrangements. Most unfortunately there is no shortage of examples of this in South Africa. Take the suspicious case of the country's strategic fuel reserve meant to secure fuel for the country in case of supply disruptions. Thamm (2016) reports that South Africa's Minister of Energy (no less), together with the country's Central Energy Fund boss, sold off pretty much all of South Africa's stockpile of fuel reserves for \$28/barrel for close to half the going price of oil at the time (\$50/barrel). The deal was evidently concluded quietly in December 2015 in a closed tender without obtaining permission from the National Treasury. Just how does a deal like this make sense?

Key Concepts and Summary

There are a number of arguments that support restricting imports. These arguments are based around industry and competition, environmental concerns, and issues of safety and security.

The infant industry argument for protectionism is that small domestic industries need to be temporarily nurtured and protected from foreign competition for a time so that they can grow into strong competitors. In some cases, notably in East Asia, this approach has worked. Often, however, the infant industries never grow up. On the other hand, arguments against dumping (which is setting prices below the cost of production to

drive competitors out of the market), often simply seem to be a convenient excuse for imposing protectionism.

Low-income countries typically have lower environmental standards than high-income countries because they are more worried about immediate basics such as food, education, and healthcare. However, except for a small number of extreme cases, shutting off trade seems unlikely to be an effective method of pursuing a cleaner environment.

Finally, there are arguments involving safety and security. Under the rules of the World Trade Organization, countries are allowed to set whatever standards for product safety they wish, but the standards must be the same for domestic products as for imported products and there must be a scientific basis for the standard. The national interest argument for protectionism holds that it is unwise to import certain key products because if the nation becomes dependent on key imported supplies, it could be vulnerable to a cutoff. However, it is often wiser to stockpile resources and to use foreign supplies when available, rather than preemptively restricting foreign supplies so as not to become dependent on them.

Self-Check Questions

Exercise:

Problem:

Explain how predatory pricing could be a motivation for dumping.

Solution:

If imports can be sold at extremely low prices, domestic firms would have to match those prices to be competitive. By definition, matching prices would imply selling under cost and, therefore, losing money. Firms cannot sustain losses forever. When they leave the industry, importers can “take over,” raising prices to monopoly levels to cover their short-term losses and earn long-term profits.

Exercise:

Problem:

Why do low-income countries like Mozambique, Lesotho, or Vietnam have lower environmental standards than high-income countries like Germany, Japan, or the United States?

Solution:

Because low-income countries need to provide necessities—food, clothing, and shelter—to their people. In other words, they consider environmental quality a luxury.

Exercise:**Problem:**

Explain the logic behind the “race to the bottom” argument and the likely reason it has not occurred.

Solution:

Low-income countries can compete for jobs by reducing their environmental standards to attract business to their countries. This could lead to a competitive reduction in regulations, which would lead to greater environmental damage. While pollution management is a cost for businesses, it is tiny relative to other costs, like labor and adequate infrastructure. It is also costly for firms to locate far away from their customers, which many low-income countries are.

Exercise:**Problem:**

What are the conditions under which a country may use the unsafe products argument to block imports?

Solution:

The decision should not be arbitrary or unnecessarily discriminatory. It should treat foreign companies the same way as domestic companies.

It should be based on science.

Exercise:

Problem: Why is the national security argument not convincing?

Solution:

Restricting imports today does not solve the problem. If anything, it makes it worse since it implies using up domestic sources of the products faster than if they are imported. Also, the national security argument can be used to support protection of nearly any product, not just things critical to our national security.

Exercise:

Problem:

Assume a perfectly competitive market and the exporting country is small. Using a demand and supply diagram, show the impact of increasing standards on a low-income exporter of toys. Show the impact of a tariff. Is the effect on the price of toys the same or different? Why is a standards policy preferred to tariffs?

Solution:

The effect of increasing standards may increase costs to the small exporting country. The supply curve of toys will shift to the left. Exports will decrease and toy prices will rise. Tariffs also raise prices. So the effect on the price of toys is the same. A tariff is a “second best” policy and also affects other sectors. However, a common standard across countries is a “first best” policy that attacks the problem at its root.

Review Questions

Exercise:

Problem:

What are main reasons for protecting “infant industries”? Why is it difficult to stop protecting them?

Exercise:

Problem:

What is dumping? Why does prohibiting it often work better in theory than in practice?

Exercise:

Problem: What is the “race to the bottom” scenario?

Exercise:

Problem:

Do the rules of international trade require that all nations impose the same consumer safety standards?

Exercise:

Problem:

What is the national interest argument for protectionism with regard to certain products?

Critical Thinking Questions

Exercise:

Problem:

How would direct subsidies to key industries be preferable to tariffs or quotas?

Exercise:

Problem:

How can governments identify good candidates for infant industry protection? Can you suggest some key characteristics of good candidates? Why are industries like computers not good candidates for infant industry protection?

Exercise:**Problem:**

Microeconomic theory argues that it is economically rational (and profitable) to sell additional output as long as the price covers the variable costs of production. How is this relevant to the determination of whether dumping has occurred?

Exercise:**Problem:**

How do you think South Africans would feel if other countries began to urge South Africa to increase environmental standards?

Exercise:**Problem:**

Is it legitimate to impose higher safety standards on imported goods than exist in the foreign country where the goods were produced?

Exercise:**Problem:**

Why might the unsafe consumer products argument be a more effective strategy (from the perspective of the importing country) than using tariffs or quotas to restrict imports?

Exercise:

Problem:

Why might a tax on domestic consumption of resources critical for national security be a more efficient approach than barriers to imports?

Problems**Exercise:****Problem:**

You have just been put in charge of trade policy for Malawi. Coffee is a recent crop that is growing well and the Malawian export market is developing. As such, Malawi coffee is an infant industry. Malawi coffee producers come to you and ask for tariff protection from cheap Tanzanian coffee. What sorts of policies will you enact? Explain.

Exercise:**Problem:**

The country of Pepperland exports steel to the Land of Submarines. Information for the quantity demanded (Q_d) and quantity supplied (Q_s) in each country, in a world without trade, are given in Table 2 and Table 3.

Price (\$)	Q_d	Q_s
60	230	180
70	200	200
80	170	220

Price (\$)	Qd	Qs
90	150	240
100	140	250

Pepperland

Price (\$)	Qd	Qs
60	430	310
70	420	330
80	410	360
90	400	400
100	390	440

Land of Submarines

- What would be the equilibrium price and quantity in each country in a world without trade? How can you tell?
- What would be the equilibrium price and quantity in each country if trade is allowed to occur? How can you tell?
- Sketch two supply and demand diagrams, one for each country, in the situation before trade.
- On those diagrams, show the equilibrium price and the levels of exports and imports in the world after trade.
- If the Land of Submarines imposes an anti-dumping import quota of 30, explain in general terms whether it will benefit or injure

- consumers and producers in each country.
- f. Does your general answer change if the Land of Submarines imposes an import quota of 70?

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Glossary

anti-dumping laws

laws that block imports sold below the cost of production and impose tariffs that would increase the price of these imports to reflect their cost of production

dumping

selling internationally traded goods below their cost of production

national interest argument

the argument that there are compelling national interests against depending on key imports from other nations

race to the bottom

when production locates in countries with the lowest environmental (or other) standards, putting pressure on all countries to reduce their environmental standards